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ABSTRACT

This final report presents eight papers resulting from research conducted during the third and final year of the "Handicapped Children as Tutors" project, which investigated effects of involving handicapped students as tutors of disabled and non-disabled elementary and secondary school students. Results of all the research showed significant positive effects of the tutoring experience on the academic achievement and social competence of tutors and tutees. Qualitative differences between cross-age tutoring and peer tutoring were observed. The titles and authors are: (1) "Handicapped Students as Tutors: A Description and Integration of Three Years of Research" (W. D. Eiserman et al.; (2) "The Effects of Reverse-Role Tutoring on the Social Acceptance of Behaviorally Disordered Students" (L. Shisler et al.); (3) "The Effects of Three Types of Tutoring on the Attitudes of Learning-Disabled Students and Their Regular Class Peers" (W. D. Eiserman and R. T. Osguthorpe); (4) "Peer Acceptance of Learning Disabled Elementary Students" (W. D. Eiserman et al.); (5) "The Effects of Reverse-Role Sign Language Tutoring on Communication Skills of Retarded Students" (S. G. Whited and R. T. Osguthorpe); (6) "The Effects of Reverse-Role Tutoring on the Attitudes of Regular Class Students toward Retarded Students" (S. G. Whited and R. T. Osguthorpe); (7) "Tutoring Interventions within Special Education Settings: A Comparison of Cross-Age and Peer Tutoring" (T. E. Scruggs and R. T. Osguthorpe); and (8) "Handicapped Students as Tutors" (S. B. Cook et al.). (CB)

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Handicapped Children as Tutors

Final Report (1985-86)

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Preface

This purpose of this report is to present the results of research conducted during the third and final year of the "Handicapped Children as Tutors" project. During this past year research has been conducted with hundreds of students with a variety of handicapping conditions, as well as with regular class students. The important aspect of the research is its focus on the successful integration of handicapped students in regular schools. Research results show that reverse-role tutoring is an effective method for helping handicapped students gain the social acceptance they need from their regular class peers. Without this kind of acceptance, integration of handicapped students into regular education settings is punishing at best.

This year's report contains eight research articles which focus on the effects of involving handicapped students as tutors. The first article might be viewed as an advanced organizer for the studies that follow. The article integrates all of the 13 studies that have been funded by the *Handicapped Children as Tutors* grant over the past three years. Each of the main premises are described upon which all of the studies have been based. These premises then lead to specific research questions and hypotheses that have been empirically tested over the past three years.

The second article, in essence, shows that regular class students who are tutored by behaviorally disordered students have more positive attitudes toward their tutors than do students who are not tutored by them. The results show that teachers of behaviorally disordered students can increase the social acceptance of their students by allowing them to function as tutors of their regular class peers.

The third and fourth studies report the results of research aimed at measuring the effects of three different kinds of tutoring with learning disabled students. The results of these studies showed that, unlike some previous research, learning disabled students' attitudes are similar toward their LD peers and toward regular class peers. Additionally, the attitudes of regular class students toward their LD peers were similar

to their attitudes toward other regular class students. Following tutoring interventions, the data showed that those who had tutored (both regular class students and handicapped students) showed the greatest gains in attitudes--especially toward school, in general. The implications are that schooling, as it is typically structured, consists of far too much passive behavior on the part of the student and that when students are given a more active role, such as tutoring another student, their attitudes toward school improve.

The fifth and sixth studies involved mentally retarded students as tutors of their nonhandicapped peers. In the fifth study the research question was, "Will the learning and teaching of sign language improve the overall communication skills of retarded tutors?" This question grew out of the research conducted during the first and second years. Several parents of retarded tutors had remarked that their child's communication skills had improved noticeably from being involved in the sign language tutoring. A comprehensive review of the literature showed that such effects have been difficult to document, although there is currently strong interest in the teaching of sign language to mentally handicapped students. The results of the study indicated that receptive and expressive language, as measured by standardized instruments, is not improved by the learning of basic sign language. The results do not show that sign language is of no value for profoundly mentally retarded students, but the study definitely brings into question the introduction of sign language into the regular curriculum of the moderately retarded student.

The results of the sixth study showed that tutoring did not improve the attitudes of regular class tutees toward their self-contained retarded tutors. Since this result conflicted with earlier data collected with retarded students in more integrated students (several previous studies with mentally retarded students in regular schools had shown that tutoring had a positive effect on attitudes), data were gathered comparing the attitudes of regular class peers toward retarded students in day schools compared

with those in self-contained classrooms in their same school. The results showed that the more segregated the students are the more positive the attitudes are of the regular class students toward their handicapped peers. When the handicapped students are in the same school, the regular class students have significantly more negative attitudes toward them than when the handicapped students are segregated in a nearby day school. Although the results obviously do not show that integration is undesirable, they do show that special and regular educators are not doing enough to assist mentally handicapped students who are in regular schools. Tutoring could clearly be one effective method for improving the social acceptance of these students.

The final two studies summarize the effects of involving handicapped students as tutors. The first compares the effects of cross-age with peer tutoring and suggests that cross-age tutoring may hold more promise for improving attitudes than does peer tutoring. The final study reports the results of a meta-analysis conducted on 19 research articles which generated 74 effect sizes. The results showed that tutoring programs were effective, that tutees generally gained more than tutors, and that the gains on self-concept and sociometric ratings were small, while gains on attitudes were larger. From the meta-analysis it was concluded that tutoring can be a "viable and potentially powerful instructional intervention for special education, and that learning-disabled, behaviorally disordered, and intellectually handicapped students can function effectively as tutors." There is further suggestion that researchers continue to investigate the effects of tutoring on social outcomes.

It is hoped that the research reported in this document will encourage other educators and researchers to continue to explore tutoring as a viable intervention in special education. Although the data collected thus far have shown that handicapped students can receive multiple benefits from acting as tutors, much work remains to be done if special educators are to take advantage of these benefits in their own classrooms.

Handicapped Students As Tutors: A Description and Integration of Three Years of Research

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Running head: HANDICAPPED STUDENTS AS TUTORS

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Handicapped Students As Tutors:
A Description and Integration
of Three Years of Research

This article is a review of a series of 13 studies which were conducted over a four year period to test the effects on social acceptance and academic achievement when handicapped students function as tutors of either regular class students or other handicapped students. In this review the evolution of the research questions addressed by the 13 studies, from the inception of the project through the fourth year, will be presented. Figure 1, which illustrates the development of the research questions which led to each of the studies, can be used as a map to guide the reader through the research discussed in the following sections.

Insert Figure 1 about here

This article will serve several purposes. First, it will provide the reader with a vicarious experience of the research issues as they arose initially, the questions (and conclusions) which led to three additional years of research, and emerging issues which have resulted in a comprehensive examination of the effects on social acceptance and academic achievement when handicapped students function as tutors. Second, as the development of the research is discussed, main conclusions and implications of each study will be highlighted. These conclusions and implications usually led to subsequent studies as well as practical suggestions for tutoring implementation in schools. Third, the article will capsulize this research and set the stage for future research and practical implementation efforts.

The figure shows that all research questions were based on two main premises (appearing at the top of the figure). Although previous research studies have shown these premises to be firmly established, only recently have educators begun to

investigate the implications of these premises for tutoring in special education.

Two of the primary problems faced by handicapped students are social rejection and low academic achievement (see Figure 1, the first premise). Research on the social status of exceptional children in regular educational settings has shown that exceptional children, especially mentally retard children, are frequently subjected to discriminatory behavior by regular class peers (Voeltz, 1982; Asher & Taylor, 1981; Macmillan, Jones, & Aloia, 1974). Learning disabled (LD) students, especially those in self-contained classrooms, are often viewed by their regular class peers as being mentally retarded and are rejected as a consequence (Bryan, 1974; Garrett and Crump, 1980).

While students labeled as behaviorally disordered (BD) do not necessarily suffer from cognitive delays, they nevertheless experience social difficulties relating to peer acceptance. In fact, inability to get along with peers has been found to be one of the major reasons for referring children to BD classes (Woody, 1969; Rubin, Simson & Betwee, 1966). Even though socialization and positive attitudes are necessary for productive and gratifying living, American schools have given little attention to their enhancement, particularly for exceptional children (Custer & Osguthorpe, 1983). Martin (1974) emphasized that there is a need to develop strategies whereby regular class children's attitudes toward handicapped students could be improved. Further, he suggested that this should be done in conjunction with the placement of handicapped students in integrated settings.

Contrary to Martin's suggestion that integration be used as a tool in enhancing social acceptance, didactic approaches are one of the primary strategies used in increasing social acceptance of handicapped students. Most of these intervention strategies involve only regular class students in the instruction. These approaches include lessons, games, role plays and other activities for regular class students to learn about handicapping conditions (Del-Val, 1981; Anderson, 1985; Smith and others, 1981; San Diego Department of Education, 1974; Cohen and others, 1982).

Very little contact with handicapped children, if any at all, is included in these strategies. Thus, it is not surprising that such strategies have not proven effective in enhancing the relationships between regular class students and their handicapped peers (Salend and Knops, 1984; Siperstein, 1977; Westervelt and McKinney, 1980; Berler, Gross and Drabman, 1982).

Research dealing with peer acceptance has shown that giving positive reinforcement and engaging in cooperative activities with another child or with the group is related to how well children are liked by their peers (Hartup, Glazer and Charlesworth, 1967; Bonney and Powell, 1953). Interestingly, though, in a review of attitudinal research, Wylie (1976) concluded that simply initiating contact between handicapped and regular class students does not necessarily reduce regular class students' negative perceptions of their handicapped peers. In determining how to foster contact between students, several researchers have suggested that a natural method for increasing positive contact is peer tutoring (Argyle, 1976; Harris and Aldridge, 1983).

Peer tutoring is not a new idea. It is one of the oldest forms of instruction known to society. As early as the first century A.D., Quintilian, in his Institutio Oratoria, described instructional settings where older children were tutoring younger children. In fact, the Latin dictum, Qui docet Dicet (one who teaches, learns), suggests that society has been aware of the benefits of being a teacher for quite some time. In more recent times, experiences with tutoring, such as in the tutoring programs Bell developed for orphans in Madras, India, have led to the belief that, "Learning is a social act", (Meiklejohn, 1882).

Most tutoring research in special education, however, has involved handicapped students as tutees or as tutors to other handicapped students. Those that have included handicapped students as tutors of regular class students have not systematically examined the effects on social acceptance (Denquin and Smith, 1980). Perhaps reverse-role tutoring, including the handicapped students as tutors to regular

class students would place the handicapped students in a position where they would be viewed as capable individuals with skills that could help regular class students and thus promote social acceptance.

A Pilot Study

As can be seen from Figure 1, these initial notions regarding the usefulness of tutoring to increase social acceptance led to the pilot study which was conducted to determine if handicapped students could actually function as tutors of regular class peers and if any social benefits might be apparent. A total of 15 fifth- and sixth-grade educable mentally retarded students tutored their regular class peers in sign language. Sign Language was selected as the tutoring topic because it was a new and novel skill to most of the students, handicapped and regular class. Furthermore, such a new skill enabled the handicapped students, with some extra training, to be more advanced in sign language than the regular class tutees.

Prior to the tutoring, recess times were changed so that the EMR children had an opportunity to play with their regular class peers. Observers recorded the amount of interaction between each EMR child and a regular class peer for three consecutive days during this free play time. Following eight weeks of tutoring, observations were made again on student interaction. Other dependent measures included: 1) a questionnaire administered to regular class tutees; 2) an interview protocol administered to parents of handicapped tutors; and 3) an assessment of sign language retention for both student groups.

The results of the observations made during free-play time showed that before the tutoring began, handicapped students spent an average of 5 percent of the recess time interacting with a regular class peer. Of the total interaction time of 135 minutes possible over three days of recess, the mean amount of social interaction for a handicapped student with regular class peers was 6 minutes, 52 seconds. Following the tutoring, this three day mean increased to 62 minutes, 13 seconds. The mean

percentage of interaction time increased from 5% to 46 % of available free play time.

A delayed sign language posttest showed that handicapped tutors retained an average of 94% of the signs they had learned while regular class tutees retained 99% of the signs. The results of the parent interviews revealed that 93% of the parents felt that their handicapped child's self-confidence had increased as a result of the tutoring. An additional 73% of the parents said that their own confidence in their child's ability to learn had increased. The remaining 27% said their perceptions of their child had not changed.

The conclusions of the first year suggested that indeed EMR students could function effectively as tutors to regular class students and that, possibly, social acceptance gains were made. The lack of a control group, however, made it difficult to assess whether or not the effects on social acceptance were caused by factors other than the experimental variables. Future examination was imperative for this reason alone. Furthermore, only one type of handicapping condition was included in this first study. Could students with other handicapping conditions also benefit from reverse-role tutoring? What benefits could be measured for handicapped students when they tutor other handicapped students or when they tutor regular class students younger than themselves?

Year One

In order to address the questions which emerged from the pilot study, a research grant from the Office of Special Education and Rehabilitation Services, U.S. Department of Education, was obtained and a series of studies were conducted over a three year period (see Figure 1). Four experiments were conducted the first year, each employing handicapped students in one of the following tutoring configurations: 1) EMR and LD children as tutors of their regular class peers in sign language; 2) LD and BD students as tutors of younger regular class students in reading; 3) LD and BD students as tutors of their handicapped peers in reading; and 4) LD and BD students

as tutors of younger handicapped students in reading. It was determined, first, to replicate the pilot study, using EMR students and a no treatment control group (Study 1A). Additionally, LD students were also used to address the question of the benefits of tutoring to children with other handicapping conditions. These studies examined the effects on social acceptance. For studies 1B, 1C, 1D and 1E it was determined that the best way to examine effects on academic achievement would be to use higher functioning children than the EMR children, such as LD and BD students. These students tutored either younger regular class students or other handicapped peers in reading.

Summaries of these studies are included in Table 1. The following are the main conclusions which were drawn from these studies. First, EMR, LD and BD children who tutored regular class peers interacted with regular class peers during free play time significantly more than before tutoring. Second, when LD and BD students tutor younger regular class students in reading, both tutors and tutees performed significantly better than the control group on criterion referenced and standardized tests. The tutors also demonstrated improved attitudes toward school. Third, when LD and BD students tutored other peer LD and BD students, both tutors and tutees demonstrated significant gains in word attack skills. Fourth, when LD and BD students tutored younger LD and BD students, both tutors and tutees showed improvement on reading skills. Interestingly, when tutors were considerably older than the tutees, the tutees experienced gains which were substantially greater than those of the tutors.

Insert Table 1 about here

As observations of the social interactions were made in studies 1A and 1B, the researchers noted there was a qualitative difference when comparing interactions between handicapped students and regular class students with interactions *within* a

group of regular class students. This was especially the case in Study 1A dealing with EMR children. Often, the handicapped students were related to in a condescending manner rather than as peers. This suggested that the amount of interaction time, as was studied in these first experiments, was not necessarily a sensitive enough measure of social acceptance and that possibly the use of a sociometric instrument might enhance our understanding of the attitudinal effects of peer tutoring. An instrument was needed that could compare the attitudes regular class students have toward handicapped students with the attitudes they have toward other regular class students.

An examination of the existing attitude measures yielded several types of measures, none of which were appropriate for our inquiry. Most of the instruments were assessing attitudes toward a general population of handicapped persons, unknown to the respondents (Voeltz, 1980; Rapier, Adelson, Carey and Kroke, 1972; Miller and Loukellis, 1982). These instruments were not appropriate because this research was focused on attitudes which were held about actual individuals in the environment under study. Another problem with the existing measures was that they focused on, or included items regarding handicapping conditions which were not being examined in this research; namely, physical impairments (Miller and Loukellis, 1982; Rapier, Adelson, Carey, and Kroke, 1972). Further, most of the attitudinal instruments which were located were not appropriate for the age levels which were being assessed here. Additionally, a number of the instruments lacked face validity; some asked "baited" or "obvious" questions, others assessed constructs which seemed unrelated to the handicapping condition. Thus, the issue of attitudinal assessment revealed that social behavior is only one component to consider when examining attitudinal assessment and that the development of a sociometric instrument was necessary before further examinations could be made.

Another interesting finding of the first year of research was that the EMR students made greater social gains than did the LD students. One of the reasons for this was

that the teacher of the LD class withdrew recess privileges as a punishment, making social interaction difficult to observe. Interviews with the regular class students indicated that the LD students were suffering from social rejection. The regular class students reported that the LD students were thought of as retarded and were called names by regular class students referring to them as "idiots" or "retards". Further, teachers reported that the LD students were experiencing various social problems which needed attention. One of the problems which was identified with Study 1B was that the tutoring intervention only allowed them contact with seven regular class students. When a much larger population of students held a negative attitude about the LD students, it is understandable that differences in their social acceptance were not remarkable after giving only seven regular class students the opportunity to interact. This research indicated that those students who were indeed tutored by the LD students experienced a positive attitudinal change toward them. How, then, could more regular class students have this experience when, usually there are fewer LD than regular class students? Both studies one and two indicated that gains in social interaction between handicapped students and regular class students were noticeable after only several weeks of tutoring. Perhaps regular class students could be tutored for shorter periods of time, and more regular class students could be included over the course of a semester. This was a consideration addressed by the second year of research (see Studies 2C and 2D).

Another problem which arose in studies 1A and 1B pertains to the implementation of the tutoring program in the classroom. Both the pilot study and this first year of research studies used a tutoring system termed "resource tutoring". The critical element in this model was not that it occurred in a resource room, because often it did not, but that it required that both tutors and tutees be pulled out of their normal classroom settings and sent to another setting for the tutoring. Three or four student pairs would come into the resource setting at one time, where they were supervised by a half-time teacher's aide. Tutoring occurred for 15 to 20 minutes each day. This

meant tutoring was ongoing for several hours each day.

One of the advantages of the resource model is that it does not require that either regular class or special education teachers take time away from their class in order to supervise the tutoring. In fact, with this model the teacher is able to spend more individualized time with the remaining students, while several are out for tutoring.

One clear disadvantage of this system, however, is the cost of providing a permanent additional staff member in the school (the half-time aide). A second problem with the model is the disruption that it causes in the make-up of a self-contained classroom. Regular classroom teachers often resent the constant flux in the make-up of their class, with some students going to speech therapy, some to the resource room, and others to a Chapter 1 program. Simply keeping track of where each student is supposed to be throughout the day requires teacher time that would be better spent with students. Further, it was observed that since teachers were not required to supervise the tutoring, they seldom came to observe the program and consequently did not fully understand it. Without understanding the program, some teachers did not realize the need for their support, nor did they understand the potential social benefits which might result. Finally, the handicapped students only associated with those regular class students that came in during their particular 15-minute tutoring time. It was likely that contact with only two or three regular class students would not have the social impact that interacting with a greater number of students would have.

If all of the tutees could come in to the classroom to be tutored at once (total class tutoring), the teachers would be interrupted only once, for 15 minutes and the LD students would have an opportunity to associate with a greater number of regular class students. This tutoring design is also related to finding in studies 1C, 1D, and 1E.

It was interesting that when LD and BD students tutored peers in reading (studies 1C and 1D), both tutors and tutees made similar gains in reading skills. When LD and BD students tutored younger LD and BD students (study 1E), however, the

tutees made substantially greater gains than the tutors. This is likely due to the fact that the LD and BD students were tutoring in skills they had already mastered. Consequently, their reading gains were not as significant. The anecdotal data, however, indicated that the responsibility of tutoring a younger child was valuable to the LD and BD students. In this case, it appeared especially beneficial for older BD children to be working with younger BD children, as they were able to see some of their own behaviors from a different perspective because they were manifested by others. Indirectly, the tutoring experience seemed to increase the BD children's ability to behave in a more socially acceptable and responsible manner. Additionally, there was some indication that there were improvements in the self-concepts of the BD and LD children who tutored.

Thus, the question was raised: To what extent can self-concept be improved upon by increasing the amount of responsibility given BD students for younger handicapped students? (This question was subsequently addressed in study 2E.) Further, after observing the benefits of LD and BD students working with younger students similar to themselves, the researchers began considering whether other exceptional populations might be paired to meet mutual needs. Perhaps it would be possible for the socially rejected BD students to add to the diverse curriculum of a peer class for gifted children. The research by Bonds and Adams (1980) and Miller, Richey and Lammers (1983) suggests that academic and social leadership roles that gifted children often hold make them natural models for others in the classroom or school. Therefore, the possibility that generalized social acceptance gains could be made by including gifted students was considered (see study 2C).

Year Two

With some of the research questions of the first year at least tentatively answered, the emerging issues of the first year were then used to formulate the

research questions for the second year (see Figure 1): 1) Can an appropriate sociometric measure be used to assess social attitudes which exist between handicapped and regular class students? Further, can this measure be used to compare attitudes regular class students have toward handicapped students with their attitudes toward other regular class students? 2) Can similar social and academic gains from peer and cross-age tutoring occur when a total class tutoring configuration is used instead of a resource tutoring model? 3) Can similar social benefits occur when the implementation of the program is reduced from five months, as used in the previous study, to three months? 4) Can the benefits of BD students acting as tutors to their peers occur when they tutor gifted peers, with the added challenge of bridging the gap between these two diverse populations? 5) When BD students are given greater responsibility for the learning of multiply handicapped children, do they experience gains in responsibility taking and other related areas?

Table 1 includes summaries for studies 2A through 2E which were conducted during this second year. Study 2A included LD and BD students as reading tutors to younger regular class students to test the gains in reading skills and self-esteem of the tutors and the reading skills of tutees. The study focused on the effects on reading abilities when cross-age, reverse-role tutoring was implemented in a total class tutoring design. The results of this study indicated gains for both the treatment tutor and tutee groups when compared with the control groups, however no significant gains were noted in self-concept. Similarly, Study 2B was conducted to examine the effects on social acceptance when peer reverse-role tutoring is implemented in a total class tutoring design. In this study, EMR students tutored their regular class peers in sign language. The results of this study indicated that a total class tutoring design led to significant social interaction effects with three different EMR classes. Studies 2A and 2B were replications of Studies 1A and 1C from the previous year, with the exception of the total class tutoring design. The conclusions made from these two studies, then, were that the use of a total class tutoring design can lead to comparable effects in

social acceptance and reading ability gains.

Several conclusions were drawn with specific regard to the implementation of total class tutoring. During each tutoring session there were at least three adults present to supervise the tutoring: the regular class teacher, the special education teacher and the special education teacher's aide. These supervisors each monitored approximately 6 tutoring pairs, checking the tutees whenever the tutor felt that the tutee was ready to demonstrate mastery of a particular instructional step.

Several advantages to the total class tutoring model were noted. First, and perhaps most importantly, the teachers developed a greater degree of ownership for the program than was observed during the previous year when resource tutoring was used. Second, total class tutoring clearly required much less outside assistance to initiate and much less continuing support, once the program has begun, making the system much more cost effective than the resource model. During the previous year the resource tutoring model required hiring a half-time aide for each special education class tutoring project. With the total class tutoring model, a single half-time aide was able to simultaneously initiate and supervise four separate self-contained classes' tutoring projects in three schools, 20 miles apart. Third, scheduling problems were simplified using the total class model. Rather than periodically worrying about which students needed to leave the class for tutoring, the special education teachers simply remained with the entire class, completing the tutoring in a single 15-minute session.

Another added dimension to the tutoring research of the second year, was the use of an originally developed sociometric attitude questionnaire, The Student Attitudes Questionnaire. The questionnaire includes a list of 20 adjectives and 14 short phrases which were inserted at the end of the question, "How much are the students in _____'s class ...?" For each of the adjectives, the student responded on a five point scale as follows: "all", "most", "some", "not much", or "none" of the time. Six tests of reliability were performed on the questionnaire with the full scale alpha ranging from .80 to .95. In Study 2C this questionnaire was used, on a trial basis, to test social

attitude changes when BD students tutored their gifted class peers in sign language. This study also examined implementation questions regarding the use of a total class tutoring design and, incidentally, supported the results of Studies 2A and 2B that it is a more effective design than resource tutoring. The results of Study 2C showed that gifted class of tutees demonstrated knowing more about the BD class than their other peers in school and, further, expressed more positive feelings toward them as a consequence. The results also indicated that comparisons of attitudes held toward different peer groups within a school yielded data which was richer than attitude data generated only from behavioral observations or expressions of attitudes only toward one peer group. Additionally, suggestions for adaptations and additions to the questionnaire were obtained by this study.

One of the drawbacks of the earlier year's tutoring studies was the length of time it required to implement a sign language tutoring program. Previous research allowed 8 weeks for the students to learn sign language before beginning the actual peer tutoring. During this time, the tutors were receiving no direct social benefits for the program. Following the training, the tutoring occurred for 10 to 12 weeks, requiring a total of 5 months to implement a program. In order to determine if a sign language tutoring program to improve social acceptance could be made more time effective, Study 2D was conducted. Over a three month period LD students acted as sign language tutors to regular class peers in a total class tutoring design. Results of this study indicated that at least 4 weeks exposure to sign language is optimum for LD students to gain adequate signing skills which will allow them to tutor confidently and effectively. Other conclusions of this study were formulated as guidelines for implementing tutoring programs: 1) Teachers of the handicapped and regular class students must agree on a convenient time for tutoring to occur which will not be disruptive of their regular curriculum; 2) Individuals responsible for supervising the tutoring must be able to capitalize on student interest in sign language. Interpersonal skill in working with students is more important than signing ability; 3)Tutoring sessions

lasting 15-20 minutes, occurring 3 to 4 times weekly over a 3 month period are more conducive for mainstreaming interests than are sessions of longer duration, administered more frequently over a shorter period; and 4) Adequate space should be allowed for each tutor to instruct the tutee without interference from other students. Seating one tutor and one tutee at a students' desk is more effective than grouping students around a single table.

Because previous research has only alluded to social benefits which accrue from cross-aged tutoring, Study 2E was designed to use multiple dependent measures in order to identify the nature of the social benefits. In this study, BD students tutored younger severely multiply handicapped students in language and social play using a resource tutoring design. Absenteeism, disciplinary referrals, attitudes toward school and academic achievement of tutors were examined. None of the measures indicated a significant effect due to the interventions. Thus, it was concluded that the cross-age tutoring which employed tutors and tutees with such drastically different functioning levels would not lead to social benefits for the tutors.

Two main issues emerged from these six studies. First, when considering the many different types of tutoring relationships which had been examined during the second year, as well as in the previous year, the researchers determined that there were some qualitative differences noted between cross-age tutoring relationships and peer tutoring relationships. Promising results of these studies, as well as those conducted by others, have indicated that both academic and social benefits can follow programs in which handicapped children participate in tutor/tutee relationships with other students their age (McHale, Olley, Marcus and Simeonsson, 1981; Kane and Alley, 1980; Travato and Bucher, 1980; Lazerson, 1980; Epstein, 1978; Snell, 1979). Several types of peer relationships have been used in tutoring studies, although the relationships have not been studied in comparison with each other. Three forms of one-way peer tutoring have been used in tutoring research involving handicapped students: regular class students tutoring handicapped peers, handicapped students

tutoring handicapped peers, and handicapped students tutoring regular class peers. Reciprocal teaching has incorporated a fourth relationship model, two-way tutoring (in which students trade role of tutor and tutee), although there is no documentation of handicapped students being included in any of these studies. Because the greatest social benefits are most likely to come to handicapped students when interacting with regular class students, research comparing the potential benefits of different tutoring relationships should focus on one-way and two-way tutoring relationships involving both handicapped and regular class students. The question is, do the social and attitudinal benefits which follow peer tutoring experiences vary, depending on the particular roles assumed by the handicapped and regular class students (see study 3A)?

Second, it was determined by the preliminary use of the sociometric attitude questionnaire that satisfactory levels of reliability were obtained. Adaptations and additions were made to the questionnaire with the intention of using it in other studies which would compare attitudes, as was done in Study 2C (see studies 3A and 3B).

Year Three

Two studies were conducted to address the emergent issues of the previous years. These are summarized in Table 1. Study 3A was conducted to compare the effects on attitudes toward peers, school and learning when LD and regular class students experienced one of the following tutor/tutee relationships: 1) Regular class students as reading tutors to LD students; 2) LD students as sign language tutors to regular class students; 3) Regular class students as reading tutors of LD students and LD students as sign language tutors to regular class students, reciprocally; and 4) regular class students who do not participate in any tutoring role with LD students. The results indicated that the tutors and tutees in all three tutoring relationships experienced pre/post differences on all measures including reading ability, academic self-esteem, attitudes about school and the sociometric questionnaire. Reciprocal

tutoring yielded the least social benefits for LD children as it was especially socially challenging for these students. It was concluded that peer, reverse-role tutoring was indeed the most socially beneficial when gains in academic self-esteem, attitudes about school and social acceptance are sought. However, peer tutoring, with regular class students as tutors and reciprocal tutoring are also viable alternatives.

In Study 3B, BD students served as sign language tutors of their regular class peers in a total class tutoring design. The sociometric questionnaire was used to compare the social attitudes of the tutees with regular class control students in three other classes in the school. Pretreatment analysis indicated that BD students were less accepted than regular class students. Post-treatment analysis showed that the tutee responded more favorably toward the BD tutors than did the control group. When examining the tutee's attitudes toward other BD students in the school, no significant difference was found which meant that the tutees did not generalize their attitude changes regarding their BD tutors to another group of BD students with whom they had had no tutoring contact.

Conclusions

Over the three year period following the pilot study, reverse-role tutoring was examined as a means by which the social and academic needs of EMR, LD and BD children could be addressed. The three populations of handicapped students were studied under a variety of tutoring conditions. Both the LD and BD children used involved in the various studies were examined in cross-age and peer tutoring roles. Also, the LD and BD children in the studies were examined in different tutoring interventions; some focused on academic achievement, others on social acceptance. Furthermore, LD and BD children were studied in a resource tutoring intervention as well as in total class tutoring interventions. Because of the restrictions due to the functioning levels of EMR students, they were studied only as peer tutors focusing on social acceptance. Additionally, EMR students were studied under resource tutoring and total class tutoring conditions.

This series of research studies has empirically tested the Latin dictum, *Qui docet Dicet* (one who teaches, learns) and has concluded that this is indeed possible when EMR, LD and BD elementary students function as tutors. When these students acted as sign language tutors, both they and their tutees learned from the experience. Further, when LD and BD elementary students acted as reading tutors they made significant gains in their own reading abilities.

When Meiklejohn stated that "learning is a social act", he probably did not realize the potential impact his words could have some 100 years later; that taking his statement seriously could lead to significant gains in the social acceptance of EMR, LD and BD students who otherwise suffer severe social isolation in our schools today. This research has found that peer tutoring is indeed a social act and can lead to significant gains in social acceptance of EMR, LD and BD students who function as tutors to their regular class peers.

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Table 1

Summary of Description of 13 Studies Including Handicapped Students as Tutors.

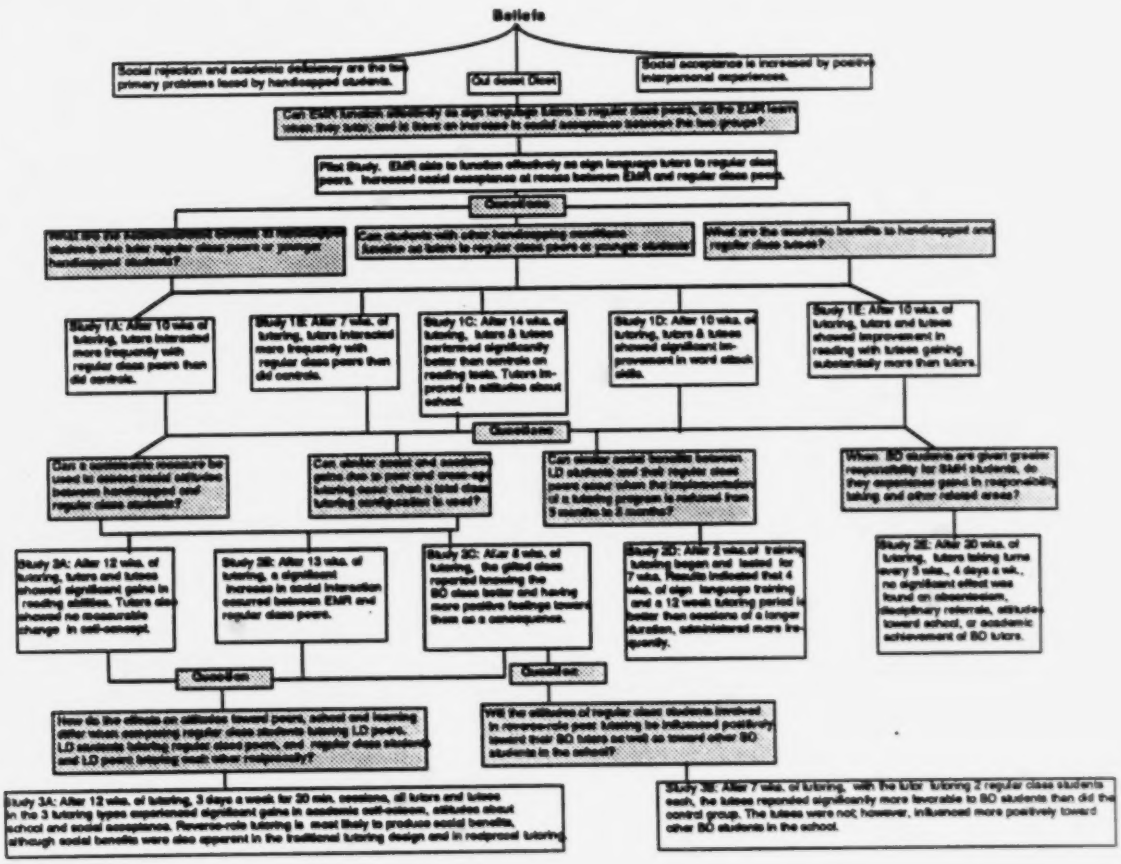
Figure 1

Flow Chart Describing the Questions Elicited and Results Obtained Over the Research Period.

Study	Description	Design	Tutors	Tutees	Finding
Pilot Study (Custer & Osguthorpe, 1983)	Reverse-role tutoring in sign language to improve social acceptance of tutors.	pre-post, no control group.	15 fifth & sixth-grade EMR children	15 fifth & sixth-grade regular class children	After 8 weekly 30. min. sessions, tutors spent significantly more time with non-handicapped during freeplay.
Study 1A (Osguthorpe et al. 1984)	Reverse-role tutoring in sign language to improve social acceptance of tutors.	Pre-post, control. Classes randomly assigned.	17 fourth-through sixth-grade EMR children	17 fourth-through sixth-grade regular class children	After 10 weeks of 15 minutes of tutoring a day, tutors interacted more frequently with regular class peers than did the control group.
Study 1B (Osguthorpe et al. 1984)	Reverse-role tutoring in sign language to improve social acceptance of tutors.	Pre-post, control. Classes randomly assigned.	7 fourth - through sixth-grade LD children	7 fourth - through sixth-grade regular class children	After 7 weeks of 15 minutes of tutoring a day, tutors interacted more frequently with regular class peers than did the control group.
Study 1C (Osguthorpe et al. 1984)	Cross-age reverse-role tutoring to improve reading skills.	Pre-post, control. Classes randomly assigned.	39 fourth-through sixth-grade LD and BD children	39 younger regular class children	After 14 weeks of tutoring, tutors and tutees both performed significantly better than controls on criterion referenced and standardized reading tests. Tutors improved in attitudes about school.
Study 1D (Osguthorpe et al. 1984)	Reverse-role tutoring to improve reading skills.	Pre-post, control. Classes randomly assigned.	8 second - through fifth-grade LD and BD children	8 second - through fifth-grade LD and BD children	After 10 weeks of tutoring, both tutors and tutees showed significant improvement in word attack skills.
Study 1E (Osguthorpe et al. 1984)	Cross-age reverse-role tutoring to improve reading skills	Pre-post, control. Classes randomly assigned.	14 elementary LD and BD children	14 elementary LD and BD children	After 10 weeks of tutoring, both tutors and tutees showed improvement on criterion references and standardized tests with tutees gaining substantially more than the tutors.
Study 2A (Osguthorpe et al. 1985)	Cross age, reverse-role tutoring to improve reading skills, total class tutoring design.	Pre-post, control. Classes randomly assigned.	12 BD and 22 LD fourth through sixth graders	12 first graders and 25 kindergarteners	After 12 weeks of tutoring, both tutors and tutees showed significant gains in reading abilities; however, tutors showed no measurable change in self-concept.
Study 2B (Osguthorpe et al. 1985)	Peer, reverse-role tutoring to improve reading, total class tutoring design.	Pre-post, no control.	15 EMR third- and fourth-graders, 25 EMR fifth- and sixth-graders	60 regular class third-through sixth-graders	After 13 weeks of tutoring, three days a week in 15 min. sessions, a significant increase in social interaction occurred between handicapped and regular class students.

table continued

Study	Description	Design	Tutors	Tutees	Finding
Study 2C (Osguthorpe et al. 1985)	Peer, reverse-role tutoring in sign language to improve social acceptance. Total class tutoring.	Pre-post, no control, same age comparison groups.	10 BD fourth- through sixth-graders	30 gifted class fourth graders	After 8 weeks of tutoring, 3 times a week for 15 min. sessions (with each tutee being tutored once a week) the gifted class reported knowing the BD students more than other peers in the school and having more positive feelings toward them as a consequence.
Study 2D (Osguthorpe et al. 1985)	Peer, reverse-role tutoring in sign language to improve social acceptance. Total class tutoring in abbreviated time period.	Pre-post, no control.	11 LD fifth graders	11 regular class fifth and sixth graders	After two weeks of sign language training, tutoring began and lasted for 7 weeks. Results suggested that four weeks exposure to sign language and a 12 week period during which tutoring occurs 3 or 4 times weekly is better for increasing social acceptance by means of peer tutoring.
Study 2E (Osguthorpe et al. 1985)	Cross-age, reverse-role tutoring in sign language and social play to increase social skills of tutors. Resource tutoring design.	Pre-post, control.	12 BD third- through fifth graders	3 severely multiply handicapped children	After 20 weeks of tutoring, tutors taking turns for 5 week periods, 4 days per week, no significant effect was found on absenteeism, disciplinary referrals, attitudes toward school or academic achievement of the BD tutors.
Study 3A (Eiserman & Osguthorpe, 1986)	Peer, reverse-role, reciprocal and traditional role tutoring in reading and sign language to increase social acceptance and/ or reading skills. Total class tutoring design.	Pre-post, regular class control	52 LD first through sixth graders	52 regular class first through fifth graders	After 12 weeks of tutoring, all tutors and tutees in the three tutoring types experienced significant gains in academic self-esteem, attitudes about school and social acceptance. Reverse-role tutoring is most likely to produce social benefits, although some social benefits were also apparent in the traditional tutoring design and in reciprocal tutoring.
Study 3B (Shisler et al. 1986)	Peer, reverse-role tutoring in sign language to increase social acceptance of tutors.Total class tutoring design.	Pre-post, comparison groups.	14 BD sixth-graders	26 regular class fifth-graders	After 7 weeks of tutoring, 4 times a week, with the tutors tutoring 2 regular class students each, the tutees responded significantly more favorable toward BD students than did the control group.


Beliefs
Social rejection and academic deficiency are the two primary problems faced by handicapped students.
Old dogs (Deaf)
Social acceptance is increased by positive interpersonal experiences.
Can EMR function effectively as sign language tutors to regular deaf peers, do the EMR learn when they tutor, and is there an increase in social acceptance between the two groups?
Pilot Study. EMR able to function effectively as sign language tutors to regular class peers. Increased social acceptance at recess between EMR and regular class peers.
Questions
What are the [illegible] benefits to handicapped students who tutor regular class peers or younger handicapped students?
Can students with other handicapping conditions function as tutors to regular class peers or younger students?
What are the academic benefits to handicapped and regular class tutees?
Study 1A: After 10 wks. of tutoring, tutors interacted more frequently with regular class peers than did controls.
Study 1B: After 7 wks. of tutoring, tutors interacted more frequently with regular class peers than did controls.
Study 1C: After 14 wks. of tutoring, tutors & tutees performed significantly better than controls on reading tests. Tutors improved in attitudes about school.
Study 1D: After 10 wks. of tutoring, tutors & tutees showed significant improvement in word attack skills.
Study 1E: After 10 wks. of tutoring, tutors and tutees showed improvement in reading with tutees gaining substantially more than tutors.
Questions
Can a sociometric measure be used to assess social attitudes between handicapped and regular class students?
Can similar social and academic gains due to peer and cross-age tutoring occur when a total class tutoring configuration is used?
Can similar social benefits between LD students and their regular class peers occur when the implementation of a tutoring program is reduced from 9 months to 3 months?
When BD students are given greater responsibility for EMH students, do they experience gains in responsibility taking and other related areas?
Study 2A: After 12 wks. of tutoring, tutors and tutees showed significant gains in reading abilities. Tutors also showed no measurable change in self-concept.
Study 2B: After 13 wks. of tutoring, a significant increase in social interaction occurred between EMR and regular class peers.
Study 2C: After 8 wks. of tutoring, the gifted class reported knowing the BD class better and having more positive feelings toward them as a consequence.
Study 2D: After 2 wks. of training, tutoring began and lasted for 7 wks. Results indicated that 4 wks. of sign language training and a 12 week tutoring period is better than sessions of a longer duration, administered more frequently.
Study 2E: After 20 wks. of tutoring, tutors taking turns every 5 wks., 4 days a wk., no significant effect was found on absenteeism, disciplinary referrals, attitudes toward school, or academic achievement of BD tutors.
Questions
Questions
How do the effects on attitudes toward peers, school and learning differ when comparing regular class students tutoring LD peers, LD students tutoring regular class peers, and regular class students and LD peers tutoring each other reciprocally?
Will the attitudes of regular class students involved in cross-age peer tutoring be influenced positively toward their BD tutors as well as toward other BD students in the school?
Study 3A: After 12 wks. of tutoring, 3 days a week for 30 min. sessions, all tutors and tutees in the 3 tutoring types experienced significant gains in academic self-esteem, attitudes about school and social acceptance. Reverse-role tutoring is most likely to produce social benefits, although social benefits were also apparent in the traditional tutoring design and in reciprocal tutoring.
Study 3B: After 7 wks. of tutoring, with the tutor tutoring 2 regular class students each, the tutees responded significantly more favorable to BD students than did the control group. The tutees were not, however, influenced more positively toward other BD students in the school.

Note: The shaded boxes contain the primary questions that gave rise to each of the studies. The unshaded boxes contain brief descriptions of each study's findings.

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The Effects of Reverse-Role Tutoring on the Social Acceptance of Behaviorally Disordered Students

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Abstract

The objective of the study was to determine whether participating in reverse-role tutoring would improve nonhandicapped students' attitudes toward behaviorally disorderd (BD) peers. A total of 88 students participated in the study: 6 fifth-grade and 8 sixth-grade aged BD tutors, 12 fifth-grade and16 sixth-grade aged regular class tutees, and 46 fifth- and sixth-grade aged regular class students comprising two contol groups. A pretest-posttest control group design was utilized to compare the responses made by tutees on a student attitudes questionnaire with the responses made by those in the control groups. Analysis of variance of the regular class students' pretest responses indicated that the BD students were less accepted than regular peers. Analysis of covariance showed that tutees rated their BD tutors significantly higher than different-class controls and that these improved attitudes were sustained three months after the treatment period. However, tutees did not generalize more positive attitudes toward a class of BD students with whom they did not have tutoring contact.

The Effects of Reverse-Role Tutoring on the Social Acceptance of Behaviorally Disorderd Students

Interest in improving student attitudes toward handicapped peers has gained impetus from current trends in mainstreaming. Although legislative enactments have clarified the educational rights of the handicapped, Jones and Guskin (1984) argue that equal educational opportunity encompasses more than passing laws and providing services: Full integration of handicapped students is contingent upon receptive social attitudes. In a review of attitudinal research, Wylie (1976) concluded that simply initiating contact between handicapped and nonhandicapped students did not necessarily reduce students' negative perceptions of their handicapped peers. Gottlieb (1975) further emphasized that nonhandicapped students must be prepared for the addition of a handicapped student into their classroom and that cognitive information was not enough to ensure a receptive social climate. The problem of nonacceptance by peers is particularly acute for behaviorally disordered (BD) students who are viewed more negatively by nonhandicapped peers than are students with other types of handicapping conditions (Parish, Ohlsen & Parish, 1978).

Several authors have described the problematic behaviors of BD students and each has mentioned the difficulty with relationships experienced by BD children. (Woody, 1969; Rubin, Simson & Betwee, 1966; Bower 1969). Research dealing with peer acceptance (Hartup, Glazer & Charlesworth,1967) showed that giving positive reinforcement and engaging in cooperative activities with another child or with the group is related to how well children are liked by their peers. Chiba (1984) also noted that children generally perceive behaviorally disordered peers more negatively than other

exceptionalities and that rejection of the BD student could be correlated with the extent to which the student manifested aggressive behavior.

Various studies have assessed the use of information, activities, literature, role playing, and contact in improving student attitudes toward handicapped peers (Ballard, Gottlieb, Corman and Kaufman,1977; Salend and Moe,1983; Lazar, Gensley and Orpet, 1971, Miller & Loukellis, 1982a, 1982b; Anderson, Del-Val, Griffin & McDonald, 1983; Del-Val, 1981). These studies have generally focused on regular students' acceptance of mentally or physically handicapped students, but they have provided no specific recommendations for increasing peer acceptance of the BD population. In an overview article which described the methodology used by researchers relating to modifying attitudes toward the handicapped, Towner (1984) cited no peer studies addressing the BD population. Johnson and Johnson (1981a, 1981b, 1982, 1983; Nevin, Johnson & Johnson, 1982) have conducted the majority of research relating to integration of students who have learning and behavioral disorders. Their studies indicated that engaging handicapped and nonhandicapped students in cooperative interaction with peers was superior to competitive or individualized activities for promoting positive attitude change.

Although many of the studies on intervention strategies and the handicapped reported that attitude changes resulted from a diversity of treatments, Gottlieb (1981) warned that attitude change fostered by discussion or information alone may be undermined by a single negative personal experience with a handicapped student. Voeltz (1980), along with Simpson, Parrish, and Cook (1976), agreed that positive contact between handicapped and nonhandicapped peers was optimal for increasing the acceptance of handicapped students. Discussing research related to improving attitudes

toward racial minorities, Watts (1984) further proposed that findings from that area may be applied to the problem of nonacceptance of the handicapped. To be effective, personal contact between the groups required that the members of the minority group be of equal or higher role status than the majority, that the social climate encouraged intimate rather than casual interaction, and that the groups be directed towards a mutual goal.

One option for establishing a social situation between handicapped and nonhandicapped students which meets the criteria described by Watts is reverse-role peer tutoring. Although the majority of research dealing with tutoring assumes that handicapped students should participate as tutees, some researchers have begun to study the benefits of placing the BD student in the role of the tutor. Several studies involving BD students as tutors focused on promoting academic growth (Gable & Kerr, 1979; Stowitschek et al., 1982; Maher, 1984) while others broadened their perspective to acknowledge that tutoring programs have also been experiments in socialization (Franca, 1983; Top, 1984; Maher, 1982). Additional studies featuring BD students as reading tutors (Lane, Pollack & Sher, 1972; Csapo, 1976) reported improvement in reading and reduction of disruptive behavior, anger, and delinquency, with an increase in the number of positive remarks made to the tutee and other tutors.

Although research has provided some information about intervention strategies relative to handicapped students mainstreamed into regular classes, Jones and Guskin (1984) reported that few studies discussed the position of the nonintegrated handicapped individual. Osguthorpe, et al. (1985) explored the social benefits of reverse-role tutoring which involved self-contained handicapped students as tutors to nonhandicapped peers in the area of sign language. These studies reported that social interaction between handicapped students in self-contained classrooms and

nonhandicapped students increased when intellectually handicapped or learning disabled students became sign language tutors to their nonhandicapped peers (Custer & Osguthorpe, 1983; Osguthorpe, et al., 1985; Eiserman & Osguthorpe, 1985). Interviews conducted with tutees suggested that they viewed sign language as a desirable skill to acquire and that as they had an opportunity to interact with individual handicapped tutors, their respect and liking for their tutors increased.

Further investigation involving a self-contained class of BD students as sign language tutors to a class of gifted peers compared tutees' and nontutees' responses toward BD students using a nonequivalent control group design. Results indicated that the mean reported by the gifted class of tutees was signficantly higher than the mean of nontutees when rating the BD class. Analysis also showed that tutees made significantly fewer negative responses than nontutees when rating the BD class (Shisler, Top & Osguthorpe, 1986). The lack of pretest data, however, precluded establishing how much attitude change occurred during the treatment period. Replication is also necessary to determine whether similar results would be reported for regular class students involved in a reverse-role tutoring program.

Thus, there is a need for research which: 1) relates specifically to BD students who are not yet mainstreamed but are in self-contained classrooms; 2) determines if BD students in that setting are viewed more negatively than are peers from regular classes; 3) introduces an intervention strategy based on cooperative activities while placing the BD student in a higher status role; 4) measures attitudes of regular class students toward the specific group of BD students with whom they are involved; and 5) measures whether hypothesized student attitude changes are generalized toward another group of BD students.

The following study was designed to address these issues and provide answers to the following questions:

1) Prior to the implementation of tutoring, will nonhandicapped students feel more negatively toward a class of behaviorally disordered peers than toward other nonhandicapped students?
2) Will nonhandicapped tutees involved in sign language tutoring feel more positively toward a class of behaviorally disordered tutors than will nontutees?
3) Will nonhandicapped tutees involved in sign language tutoring feel more positively toward a class of behaviorally disordered students with whom they do not have tutoring contact than will nontutees?

Method

Subjects and Setting

Students selected for participation in the study were enrolled in a western rural elementary school with an enrollment of approximately 500 students. Individual students were assigned to the two BD classes on the basis of anecdotal records indicating serious behavioral and/or emotional problems and by recommendation from a special education team comprised of the student's former principal, resource teacher, speech therapist, psychologist, nurse, and social worker.

Eight students (7 males and 1 female, ages 11-12) formed one of the self-contained BD classes. This class, which was composed of sixth-grade age BD students, will be referred to as the sixth-grade BD class. The second BD class, which had a slightly younger mean age, also had eight students enrolled at the beginning of the study, but due to excessive absences or lack of parental permission, only 6 of the students (5 males and 1 female, ages 9-12) were involved in the tutoring. Since the majority of students in this class were the age of typical fifth-graders, it will be referred to as the fifth-grade BD class. During the course of the research, several additional students were transferred into the units but did not participate in the study.

Twenty-eight fifth-grade and sixth-grade students from two regular classes acted as sign language tutees and as respondents on attitude questionnaires. The remaining 25 students from the two classes (same-class controls) were not involved in the tutoring treatment but responded on attitude questionnaires and had classroom contact with students receiving tutoring. To control for possible contamination effects, 21 additional

students from a split fifth/sixth grade class (different-class controls) responded on attitude questionnaires but had no involvement in the tutoring treatment.

Research Design

A pretest-posttest control group design was employed in the study with an additional posttest being administered in order to measure the delayed effects of the treatment. Sixteen students from the regular sixth-grade class were randomly assigned as tutees to the sixth-grade BD tutors, while 12 students from the regular fifth-grade class were randomly assigned as tutees to the fifth-grade BD tutors. The remaining fifth-grade and sixth-grade students, as well as 21 students from a gifted fifth-sixth grade class, acted as controls in the study.

Student attitude questionnaires were administered prior to tutoring treatment. Three copies of a student attitude questionnaire were administered to the regular fifth-grade and sixth-grade students asking them to rate the fifth-grade BD class, the sixth-grade BD class, and the regular split fifth/sixth-grade class. The split fifth/sixth-grade students also completed the attitude questionnaire in reference to each of the two BD classes. At the conclusion of the treatment period, the students responded to the attitude questionnaire a second time as a posttest measure. Finally, to assess the permanency of attitude change, the tutees also completed a delayed posttest three months after the conclusion of treatment in reference to the BD class with which they had tutoring contact.

Instrument

A portion of the items on the questionnaire were created specifically for the study, while others were taken from an instrument developed by Cartledge, Frew, and Zaharias (1984) designed to measure attitudes toward learning disabled students. Items

were selected from this instrument based on two criteria: 1) applicability to the BD population; and 2) the quality of the item as reported in their original study in which 450 regular class students used the instrument. The first portion of the questionnaire presented the question, "How much are the students in [teacher's name of designated class] class _____?" followed by 20 adjectives (e.g., "nice, "mean", "friendly") to which the students responded by marking one of five labeled boxes (i.e., "all of the time," "most of the time," "some of the time," "not much of the time," or "none of the time") which best described how much of the time the class being rated demonstrated that characteristic. The remaining 11 items were formatted as questions (e.g. "How much would you like them to be in your class?", "How much do your friends like them?") and students again indicated their choice by placing a check mark in one of the five boxes .

To assess the reliability of the instrument, reliability coefficients were calculated for the regular-class students pretest responses toward the fifth-grade BD class, the sixth-grade BD class, and the fifth/sixth-grade class. Cronbach's alpha for each group of responses were respectively .93, .95, and .96.

Instructional Materials

The BD tutors were provided with sets of vocabulary cards which on one side contained a printed word, a picture of the word, and a signed graphic representation of each word. The opposite side, facing the tutee, showed only the printed word. Conversational sentences in sign language were also designed that incorporated printed words and graphic sign representations. Small wooden stands were provided as mounts for the interchangeable card sets.

Training and Tutoring Procedure

Students from the BD classes were trained in basic sign language vocabulary for

approximately 6 weeks. Training sessions, which lasted 15 to 20 minutes, were conducted in each of the two classes 4 times weekly. During the seventh week, the students were also instructed in how to be effective tutors and were taught to set up and put away tutoring materials, to keep records, to demonstrate and monitor sign configurations, and to give praise.

Tutoring sessions, involving the fifth-grade and sixth-grade students as tutees, were then initiated and continued for an additional 7 school weeks. Each handicapped student tutored 4 times weekly, with the 2 assigned tutees being tutored twice weekly on alternate days. Tutoring sessions were conducted in the BD classrooms during 15-minute periods. Each tutor generally worked with one assigned tutee; however, in the case of absences, pairs were temporarily reassigned for the session. Therefore, many of the tutees had the opportunity to associate briefly with more than one tutor.

The tutoring pairs moved through the sequence of materials at their own rate and in each class the teacher and the aide rated the BD students daily on their abilities to demonstrate signs, to monitor and praise the tutees, to set up and put away materials, and to keep records of the tutees' progress. At the end of each week, the BD student from each class who had accrued the most points was awarded a small trophy. This helped the tutors to gauge their own abilities and to be motivated to improve their tutoring skills.

Data Analyses

To analyze the results of the attitude questionnaire, each student response was assigned a value from 1 to 5, with the higher number denoting a more positive response toward the class being rated. Total scores were computed for each student on the pretest and posttest measures. Linton, Gallo & Logan (1975) outline two major trends among statisticians for analyzing data of this type. Some statisticians argue that ordinal

data does not meet the assumptions underlying parametric techniques and that only nonparametric statistics should be used in behavioral science research. Others argue that the violation of assumptions does not seriously impair the usefulness of parametric techniques and that they should be used because of their greater power. Minium and Clarke (1982) suggest that the most serious problem arises if distributional assumptions are seriously violated and sample size is small. For the analysis in this study, both parametric and nonparametric techniques were utilized. Pretest data comparing the nonhandicapped fifth- and sixth-grade students' ratings of regular and BD classes were analyzed parametrically. In the same manner, data grouped to compare tutees', same-class controls', and different-class controls' ratings of BD and regular students (in each group $n > 20$) were analyzed using parametric techniques. For more specific comparisons of the treatment effects on the fifth-grade tutees and same-class controls and the sixth-grade tutees and same-class controls (in each group $n < 20$) nonparametric techniques were used.

To determine whether nonhandicapped students held more negative attitudes toward BD peers than toward other nonhandicapped students, one-way analysis of variance was conducted comparing the fifth-grade and sixth-grade students' combined pretreatment responses toward regular and BD peers. The Student-Newman-Keuls (SNK) post-hoc procedure was then used to indicate which classes were viewed differently using an alpha level of .05.

In order to examine whether nonhandicapped students involved in reverse-role tutoring demonstrated an increase in positive attitudes toward their class of BD tutors, the attitude scores of tutees, same-class controls, and different class controls were compared. Because the different-class controls (fifth/sixth-grade) could not be randomly

assigned to a control group, analysis of covariance, using the posttest score as the dependent variable and the pretest score as the covariate, was selected as the most appropriate statistical technique. Similarly, a second analysis of covariance procedure determined whether nonhandicapped students involved in reverse-role tutoring demonstrated an increase in positive attitudes toward the class of BD students with whom they did not have tutoring contact . If significant differences were found between groups, the SNK post-hoc procedure, with the alpha level set at .05, was applied to disclose which groups differed in their responses.

To determine whether hypothesized treatment effects produced longer-term attitudinal changes, two paired t tests were also conducted to assess tutees' pretest/delayed posttest and posttest/delayed posttest responses. To control for changes in error rates due to the use of multiple tests, a new error rate (p') was computed to reflect the desired error rate of $p<.05$ according to the following formula: $p' = 1/20$ N. Therefore, the adjusted error rate of $p'<.025$ reflected the chosen error rate used to evaluate the significance of the paired t tests.

Because nonparametric techniques equivalent to analysis of covariance do not exist, Kruskal-Wallis one-way analysis of variance was computed on pre and post attitude measures for the fifth-grade tutees', fifth-grade same-class controls', sixth-grade tutees', and sixth-grade same-class controls' responses toward the regular fifth/sixth grade, the fifth-grade BD class, and the sixth-grade BD class. When significant differences were

found, Ryan's post-hoc procedure, with the alpha level set at .05, was used to determine which class being rated differed from the others.

Student absences occasionally occurred on days when measurement insruments were administered. To avoid introducing biases which may have arisen if students were singled out to respond on the attitude questionnaires, students with missing data were simply excluded from the analyses.

Results

Relative to the first research question, comparison of the nonhandicapped fifth- and sixth-grade students' combined pretreatment responses toward the fifth-grade BD class, the sixth-grade BD class, and the regular fifth/sixth-grade class showed a signficant difference between classes being rated $F(2, 153) = 25.97$, $p<.001$ (see Table 1). Since significant differences were found between groups on the one-way analysis of variance, the SNK post-hoc procedure was applied. Results indicated that the regular fifth/sixth-grade class was rated significantly more positively than were either of the BD classes ($p<.05$). Therefore, it was determined that the regular students surveyed held more negative attitudes toward BD students in self-contained classes than toward peers in regular classes.

Insert Table 1 about here

To examine the attitudes relative to the second research question, an analysis of covariance on the tutees', same-class controls', and different-class controls' responses toward BD classes was conducted and showed a significant difference between groups, $F(2, 90) = 6.26$, $p<.01$ (see Table 2). Post-hoc analysis using the SNK on adjusted posttest means found that the tutees rated their BD tutors, with whom they had contact,

significantly higher than the different-class controls rated the BD classes ($p<.05$). The analysis did not, however, show a significant difference between responses made by tutees and same-class controls.

Insert Table 2 about here

Further analyses were conducted to investigate the similarities and differences in the rating patterns exhibited by the fifth-grade and sixth-grade tutees and same-class controls. Kruskal-Wallis analysis of variance and subsequent post-hoc analysis showed that on pretreatment measures both tutees and controls from the fifth- and sixth-grades viewed the regular fifth/sixth-grade class more positively than they viewed the BD classes. On the posttest measures, however, the fifth-grade tutees demonstrated attitude changes toward their BD tutors. While they continued to rate the regular fifth/sixth-grade class significantly higher than the sixth-grade BD class, there were no significant differences between their ratings of the regular fifth/sixth-grade class and the fifth-grade BD class of tutors. Likewise, on the posttest measures, sixth-grade tutees exhibited attitude changes and no longer viewed the regular fifth/sixth grade more positively than either BD class (See Figure 1).

Insert Figure 1 about here

The response patterns of the same-class controls in Figure 1 illustrated that both the fifth-grade and sixth-grade controls ranked both of the BD classes very similarly on pretest measures. Posttest results show that each control group's mean rankings of their same-age BD class increased slightly, while their mean rankings of the other BD class and the regular 5th/6th grade class decreased slightly. Although no significant changes in

mean rankings were found for either control group, the tutees' responses showed some fluctuation in favor of their classmates' tutors.

Therefore, it can be concluded that students involved in reverse-role tutoring felt more positively toward their class of BD tutors than did a different-class control group of nonhandicapped students. The tutees did not, however, demonstrate significantly more positive attitudes than same-class controls.

To examine the attitudes relative to the third research question, an analysis of covariance on the tutees', same-class controls', and different-class controls' ratings of the BD classes showed no significant difference between groups, $F(2, 90) = .08$, $p > .1$ (see Table 3). Therefore, it was concluded that the tutees did not feel more positively toward a class of BD students with whom they did not have tutoring contact than did control groups.

Insert Table 3 about here

Finally, two paired t tests determined whether the attitude changes shown by tutees toward their BD tutors subsequent to treatment were also noted after three months. Comparison the tutees' pretest responses ($M = 82:57$, $SD = 17.24$) with delayed posttest responses ($M = 94.29$, $SD = 20.95$) showed that the tutees rated their BD tutors significantly more positively on the delayed posttest, $t(20) = -2.85$, $p < .025$. Comparison of the tutees' posttest responses ($M = 104.00$, $SD = 22.42$) with delayed posttest responses ($M = 94.29$, $SD = 20.95$) showed no significant change in tutees' attitudes, $t(20) = 2.37$, $p > .025$. Therefore, the tutees maintained signficantly more positive attitudes toward their BD tutors even after a three-month period without further treatment.

Discussion

The study provided clear evidence that, without intervention, the BD students in self-contained classes were less accepted by their nonhandicapped peers. While past research showed that BD students in regular classes were less accepted by their peers, the present study showed that negative attitudes were also directed toward BD students in self-contained classes. Thus, when BD students are mainstreamed into regular classes, they continue to be socially isolated. Without intervention, it is unlikely that BD students will become fully integrated into regular-class social settings.

Reverse-role tutoring, which allowed BD students to tutor nohandicapped peers, produced significant attitude changes in tutees toward their tutors. Previous research reported that tutoring increased the amount of social integration experienced by handicapped tutors, while the present study illustrated that the attitudes of tutees are also improved: The tutees' posttest mean rating of their BD tutors was almost equivalent to the mean given to regular class peers. These are important findings in view of the recent results reported by Ray (1985) which demonstrated that even when observations show that handicapped students are "accepted" by their peers, the peers may still harbor negative attitudes toward the handicapped students. The data reported by Ray, as well as the results from the present studies, indicate that attitudinal measures are of critical importance in research which attempts to foster integration of behaviorally disordered students with regular class peers. The study did not, however, indicate that the tutees' acceptance of their BD tutors was generalized toward another class of BD students. Thus, the tutees did not change their views about students in another BD class within the same school.

An interesting question is raised relative to the inclusion of only half of the students from two regular classes as tutees: To what extent were the tutees' attitudes toward BD students adopted by same-class peers? The results of the study showed that same-class controls were not signficantly different from tutees in their responses toward the BD tutors. This is not to say, however, that both groups experienced the same level of attitude change--it merely signifies that slight increases were found when controls rated their classmates' tutors. This finding warrants further research to determine whether tutees' classmates would also become more accepting of BD students as an indirect result of the tutoring program.

A slightly paradoxical finding arose from the data related to the tutees' views of BD students who were not their tutors. The results showed no significant difference between tutees' and controls' ratings of the other class of BD students; thus, the tutees did not generalize more positive attitudes for their BD tutors toward an additional class of BD students in the school. The philosophy underlying most research related to attitudes toward the handicapped assumes that individuals manifesting attitude change toward one or several members of a specific handicapped population will also experience a generalized attitude change toward the entire population, or conversely, that the attitudes reported toward a hypothetical population are also applied to specific members of that group. The findings reported here challenge such assumptions and provide evidence that, at least in the the case of the BD population, nonhandicapped students may manifest attitude change toward one group while showing no change toward another.

Johnson and Johnson (1984) hypothesized that cooperative contact allowed the nonhandicapped student to see a handicapped peer in a less-stereotyped, more

differentiated way. From the findings of the present study, it would seem that the nonhandicapped students viewed the two BD classes as similar to one another and dissimilar from a regular class prior to tutoring. On posttest measures, however, the tutees rated the BD tutors similarly to regular class peers and differently from the other BD class. Perhaps it was not that the tutees changed their views of BD students generally; rather, it was that they no longer thought of their tutors as behaviorally disordered. It is, of course, unrealistic to assume that the tutees were no longer aware of their tutor's emotional disabilities, but it is plausible to believe that the positive characteristics of the handicapped students, previously overlooked by the tutees, came to be the dominant attributes by which the tutors were judged. Thus, the tutees continued to hold stereotyped prejudices toward the class with whom they had no contact while demonstrating more acceptance of their BD tutors.

There is a pressing need for research that addresses this topic, for a number of intervention strategies actually focus on explicating differences between handicapped and nonhandicapped students. Although role-playing and simulation of handicapping conditions can help nonhandicapped students understand the differences of their handicapped peers, if not followed by instruction focusing on similarities, the intervention may actually promote stereotypical views. In addition, many researchers rely on attitude measures toward a hypothetical population to judge the effectiveness of intervention strategies designed to promote attitude change toward the handicapped. If the intent of the researcher is to encourage attitude change toward specific individuals with handicaps, valid measures must reflect actual change toward the individuals, rather than change toward a hypothetical population.

It is not possible to directly judge the effectiveness of reverse-role tutoring against other intervention strategies, but useful comparisons may still be made. Extensive research described by Johnson and Johnson provided 7 to 12 hours of cooperative contact time between nonhandicapped and mainstreamed BD students over approximately 15 day periods (1981a, 1981b, 1982, 1983). Their cooperative activities involved handicapped students working in small groups with peers to complete regular class assignments in areas such as math and social studies. Although the researchers reported that the handicapped students involved in this treatment were more socially accepted than were students working competitively or individually, the studies did not report how well the handicapped students were accepted in comparison to other classmates. In contrast, reverse-role tutoring structured only three-and-a-half hours of contact time between students from a regular class and BD students from a self-contained class over a two month period. Results showed significant attitude changes for tutees and, more importantly, provided evidence that the tutees rated their BD tutors similarly to regular class peers on posttest measures. This is a particularly important area to explore, for interventions which show significant changes toward handicapped students using only pre and post measures may fail to note that the handicapped students are still considerably less accepted than are other peers. It is possible that the social distance between BD students and peers may be so great that even statistically significant changes are minimal when compared with the remaining social disparity.

On the level of practical application, many BD students in self-contained settings are working their way toward full participation in regular classrooms. To facilitate their social acceptance by nonhandicapped peers, the effects of tutor-tutee pairing based on prospective class placements and subsequent integration should be assessed. In this

way, the BD student could become closely acquainted with several of the students in the targeted regular class before being mainstreamed. The experience would allow the regular class tutees to see the BD student in a competent role, perhaps paving the way for the student to assume a more equal social position when finally entering the regular classroom. There is little question that adjustment to the regular class could be made easier if the regular class students already possessed positive attitudes toward the BD student. For this reason, continued effort should be focused on strategies to improve attitudes toward students with behavioral disorders.

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Table 1

Analysis of Variance of Regular Students' Pretest Responses Toward Regular and BD Classes.

Analysis of Variance

Source	df	SS	MS	F	P
Between groups	2	23643.5	11821.75	25.97	.000
Within groups	153	69648.67	455.22		
Total	155	93292.17			

Pretest Means of Regular Students' Responses Toward Regular and BD Classes

Class Being Rated	Number of Responses[a]	M	SD
Regular 5th/6th Grade Class	52	102.04	23.04
Fifth-Grade BD Class	52	75.52	19.4
Sixth-Grade BD Class	52	76.35	21.42

[a]Includes responses made by 24 students from a fifth-grade class and 28 students from a sixth-grade class.

Table 2

Analysis of Covariance of Controls and Tutees' Responses Toward BD Tutors.

Analysis of Covariance

Source	df	SS	MS	F	P
Covariate (Pretest)	1	10581.69	10581.69	26.75	.000
Main Effect (Respondents)	2	4953.37	2476.68	6.26	.003
Residual	90	35598.95	395.54		
Total	93	51134.00	549.83		

Pretest, Posttest, and Adjusted Posttest Means of Controls' and Tutees' Responses Toward BD Tutors

		Pretest		Posttest		
				Obtained		Adjusted
Respondents	Number of Responses	M	SD	M	SD	M
Tutees	27[a]	78.59	17.25	101.89	26.02	103.48
Same-Class Controls	25[b]	74.64	19.54	89.56	23.19	93.72
Different-Class Controls	42[c]	86.45	17.77	89.33	20.74	85.83

[a] Includes fifth-grade tutees' responses toward fifth-grade BD class and sixth-grade tutees' responses toward sixth-grade BD class. [b]Includes fifth-grade controls' responses toward fifth-grade BD class and sixth-grade controls' responses toward sixth-grade BD class. [c]Includes fifth/sixth-grade controls' responses toward fifth-grade and sixth-grade BD classes combined.

Table 3

Analysis of Covariance of Controls' and Tutees' Responses Toward BD Students With Whom There Was No Tutoring Contact.

Analysis of Covariance

Source	df	SS	MS	F	P
Covariate (Pretest)	1	14950.88	14950.88	52.77	.000
Main Effect (Respondent)	2	43.18	21.59	.08	.93
Residual	90	25500.79	283.34		
Total	93	40494.85	435.43		

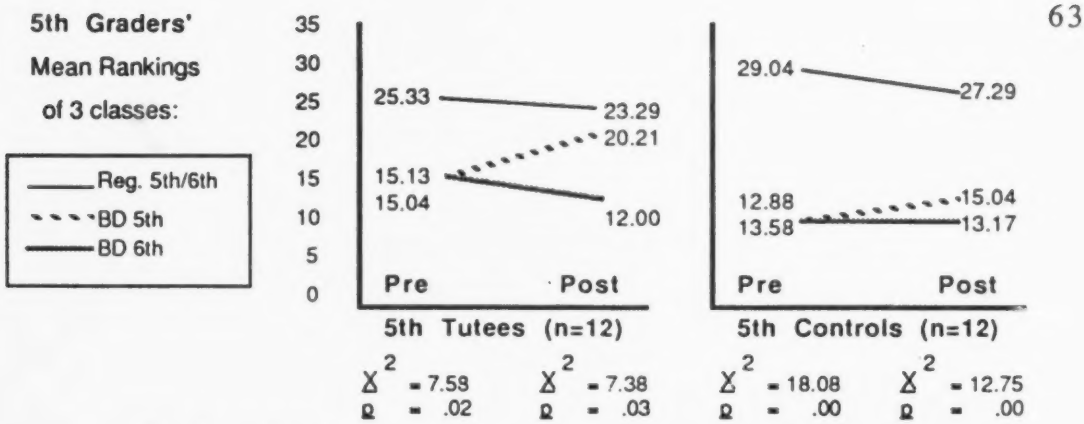
Pretest, Posttest, and Adjusted Posttest Means on Controls' and Tutees' Responses Toward BD Students With Whom There Was No Tutoring Contact

		Pretest		Posttest		
				Obtained		Adjusted
Respondents	Number of Responses	M	SD	M	SD	M
Tutees	27[a]	76.00	22.26	83.85	22.42	86.42
Same-Class Controls	25[b]	74.28	22.83	83.60	19.44	87.22
Different-Class Controls	42[c]	86.45	17.77	89.33	20.74	85.53

[a] Includes fifth-grade tutees' responses toward sixth-grade BD class and sixth-grade tutees' responses toward fifth-grade BD class. [b]Includes fifth-grade controls' responses toward sixth-grade BD class and sixth-grade controls' responses toward fifth-grade BD class. [c]Includes fifth/sixth-grade controls' responses toward fifth-grade and sixth-grade BD classes combined.

Figure Caption

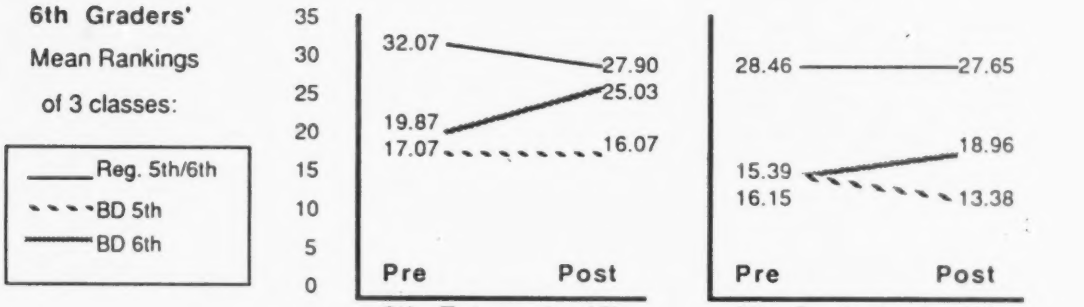
Figure 1. Kruskal-Wallis analysis of variance for tutees' and same-class controls' responses toward regular and BD classes.



χ^2 = 7.58, p = .02 | χ^2 = 7.38, p = .03 | χ^2 = 18.08, p = .00 | χ^2 = 12.75, p = .00

Ryan's test showed: Reg. 5th/6th were viewed more positively than BD 5th or BD 6th (p<.05). | Reg. 5th/6th were viewed more positively than BD 6th only (p<.05). | Reg. 5th/6th were viewed more positively than BD 5th or BD 6th on Pre and Post (p<.05).

Note. p<.05, critical value = 3.32, d.f. 1 = 2. d.f. 2 = 35.



χ^2 = 11.06, p = .00 | χ^2 = 6.27, p = .04 | χ^2 = 10.77, p = .00 | χ^2 = 10.34, p = .01

Ryan's test showed: Reg. 5th/6th were viewed more positively than BD 5th or BD 6th (p<.05). | No significant difference between groups (p<.05) | Reg. 5th/6th were viewed more positively than BD 5th or BD 6th on Pre and Post (p<.05).

Note. p<.05, critical value = 3.23 d.f. 1 = 2, d.f. 2 = 44.

Note. p<.05, critical value = 3.32 d.f.1 = 2. d.f.2 = 38.

The Effects of Three Types of Tutoring on the Attitudes of Learning Disabled Students and Their Regular Class Peers

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Running Head: Effects of Tutoring on Attitudes

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Abstract

The purpose of this study was to compare the effects on attitudes toward peers, school and learning when LD and regular class students experience one of the following tutor/tutee relationships: 1) Treatment One: regular class students as reading tutors of LD students; 2) Treatment Two: LD students as sign language tutors of regular class students; 3) Treatment Three: regular class students as reading tutors of LD students and LD students as sign language tutors of regular class students, reciprocally; and 4) Control Group: regular class students as a no treatment control group. A total of 52 students in self-contained LD classroom participated in the study along with 72 regular class students ranging from kindergarten to sixth-grade. A pretest-posttest design was used to compare the three treatment group as well as the regular class control group. Multivariate analysis of covariance indicated pre-post gains by all treatment groups on peer attitudes as well as attitudes about school and learning. The regular class control group experienced gains only on attitudes about school and learning. Further univariate analysis indicated that those who tutored tended to experience the greatest attitudinal improvements. While Regular class students in reciprocal tutoring experienced attitudinal gains, LD students experienced less of a gain.

The Effects of Three Types of Tutoring on the Attitudes of Learning Disabled Students and Their Regular Class Peers

Two of the primary problems faced by handicapped students are social rejection and negative attitudes toward school and learning. Learning disabled students (who will be referred to as LD students throughout this report), especially those in self-contained classrooms, are often viewed by their regular class peers as being mentally retarded and are rejected as a consequence (Bryan, 1974; Garrett and Crump, 1980). However, even though socialization and positive attitudes are necessary for productive and gratifying living, American schools have given little attention to its enhancement (Custer & Osguthorpe, 1983). Subsequently, special tutoring programs have been used with the hope of addressing handicapped students' social and attitudinal deficiencies (Gerber & Kauffman, 1981; Krouse, Gerber & Kauffman, 1981; Strain, 1981; Osguthorpe, Eiserman, Shisler, Top and Scruggs, 1985).

Promising results have been reported with respect to academic and social (attitudinal) benefits following programs in which handicapped children served in some capacity of a tutor/tutee relationship with other students their age (Osguthorpe et al., McHale, Olley, Marcus and Simeonsson, 1981; Kane and Alley, 1980; Travato and Bucher, 1980; Lazerson, 1980; Epstein, 1978; Snell, 1979). Several types of peer relationships have been used in tutoring studies, although the relationships have not been studied in comparison with each other. Three forms of one-way peer tutoring have been used in tutoring research involving handicapped students: regular class students tutoring handicapped students, handicapped students tutoring handicapped students, and handicapped students tutoring regular class students. Reciprocal teaching has incorporated a fourth relationship model,

two-way tutoring (in which students trade roles of tutor and tutee), although there is no documentation of handicapped students being included in any of these studies. Because the greatest social benefits are most likely to come to handicapped students when interacting with regular class students, research comparing the potential benefits of different tutoring relationships should focus on one-way and two-way tutoring relationships involving both handicapped and regular class students. The question is, do the social benefits as well as benefits referring to attitude toward school and learning which follow peer learning experiences (tutoring) vary, depending on the particular roles assumed by the handicapped and regular class students?

The purpose of this study is to compare the effects on attitudes toward peers, school and learning when LD and regular class students experience one of the following tutor/tutee relationships: 1) Treatment One: regular class students as reading tutors of LD students; 2) Treatment Two: LD students as sign language tutors of regular class students; 3) Treatment Three: regular class students as reading tutors of LD students and LD students as sign language tutors of regular class students, reciprocally; and 4) Control Group: regular class students as a no treatment control group.

Six hypotheses were tested in order to address the above purpose of the study:

1. Regular class and LD students who are in one of the three treatment groups will experience significant gains in attitudes about school and in social acceptance of the other kinds of students while regular class control students will not experience significant attitudinal gains.

2. When comparing LD students in treatments one, two and three, those who experience treatment three will demonstrate the most significant increase in positive attitude toward school, while students who receive treatment two will demonstrate the second most significant increase and those who experience treatment one will

demonstrate the least significant increase as measured by school attitude tests.

3. Regular class students who experience treatment three will demonstrate the most significant increase in positive attitude toward school, while students who receive treatment one will demonstrate the second most significant increase and those who receive treatment two will demonstrate the least significant increase as measured by school attitude tests, when compared with regular class students who do not experience any kind of tutoring.

4. When comparing LD students in treatments one, two, and three, those who receive treatment three will demonstrate the most significant increase in peer attitude acceptance as measured by the attitude instruments, while students who receive treatment two will demonstrate the second most significant increase in peer attitude acceptance, and those students who receive treatment one will demonstrate the least significant increase in peer attitude acceptance.

5. Regular class students who receive treatment three will demonstrate the most significant increase in peer attitude acceptance as measured by the attitude instruments while students who receive treatment one will demonstrate the second most significant increase and those who receive treatment two will demonstrate the least significant increase when compared with regular class students who do not experience any kind of tutoring.

6. LD students and regular class students in group one will demonstrate the most significant increase in reading ability, while students in group three will demonstrate the second most significant increase, and students in groups two and four; will demonstrate the least significant increase in reading ability.

Further, differences in tutee/tutor relationships that could be noted when comparing the experience of the older students with the younger students involved in the study were of

interest.

Methods

Subjects

Subjects selected for the study were enrolled in four schools in the Davis School District, north of Salt Lake City. The people of the area were predominantly middle-class caucasion with light industry and agricultural occupations. Four schools in the district with self-contained learning disabled (LD) classrooms, were included in the study. A total of 52 students in the self-contained LD classrooms participated in the study along with 72 regular class students, ranging from kindergarten to sixth-grade, were taken from appropriate grade-ages in each school for inclusion in the treatment groups. Approximately 85% of the self-contained LD students were bussed in from another neighborhoods outside of the school boundries.

Research Design

All of the LD students in the four classrooms whose teacher's agreed to participate were included in the study. Regular class teachers in each school were asked to nominate students which could benefit from extra reading experience and interaction with the LD students. These teachers were each told how many students to nominate for the program. While each LD student was included in one of the three treatments, enough regular class students were selected in order to have a regular class control group. There was no control group consisting of LD students.

Instruments

Five instruments were administered to all of the students in the three treatment groups as pretest and posttests: one standardized reading achievement test (Woodcock-Johnson

Reading Test Subtests #13, #14 and #15),one standardized self-attitude test (Student Perceptions of Ability Scale), and three measures of attitude toward school or classmates (Student Attitudes Questionnaire, Attitudes About School, and the Who's On Your Team Test). The SPAS instrument is comprised of 70 statements about which the student determines to be "un-like" or "like" himself or herself. This instrument was used to determine differences in academic self-esteem between the LD and regular class students. This instrument has been used widely in elementary schools. Estimates of internal concistency were determined by Cronbach's alpha reported at .915. Test-retest reliability data were collected resulting in a stability coefficient for the full SPAS at .834. The Students Attitudes Questionnaire includes a list of 20 adjectives and 14 short phrases which are used at the end of the question, "How much are the students in _____'s class...?" For each of the adjectives the student responds on a five point scale which illustrated as follows: all, some, no much, or none of the time. The Attitudes About School instrument consists of eight questions pertainig to attitudes about school and uses the same scale described for the Students Attitudes Questionnaire. Four tests of reliability were performed on the Attitudes About School and Student Attitudes Questionnaire on each of group of students in the study; LD, regular class, younger and older. The full scale alpha ranged from .80 to .95. The Who's On Your Team instrument was designed to focus on social distance choice behavior between students in elementary school. This instrument required students to list, in rank order, five students they each wanted on their team. While this measurement technique was not tested for reliability, a number of previous studies which have used the technique have reported confidence in it (Bryan, 1974; Garrett & Crump, 1980; Prillaman, 1981). Observation data were collected by an assistant researcher on a daily basis throughout the study for purposes of treatment verification. This data included daily observations of tutoring and sign language training, tutoring sessions as well as social

interactions, and interviews with students and teachers. Frequent meetings with the assistant provided useful information in assuring that the treatments were being administered appropriately.

All testing was performed by university Special Education and Curriculum and Instructional Science students who were trained to administer the tests.

Instructional Content and Materials

Two sets of instructional materials were used: one for the reading tutoring and the other for the sign language tutoring.

Sign Language Materials. The instructional materials used for sign language tutoring were adapted from existing materials utilized in previous research (Osguthorpe et. al.). Prompt cards were used on which the tutor saw a photograph of the object or word, graphic representation of the hand shapes (signs), and the printed word to be signed. The reverse side of the prompt card consisted of only the printed word to be signed. Groups of cards were mounted on flip stands which stood independently while the tutor flipped from one card to the next during tutoring.

The sign language vocabulary used in these materials included numbers, colors, the alphabet, a number of complete sentences and 150 nouns and verbs familiar to both the handicapped and nonhandicapped students.

Reading Materials. The instructional materials used for reading tutoring were adapted from the Beginning Reading I and II structured tutoring program developed by Grant Von Harrison (1980). This tutoring program was originally designed for parents, aides or older students' use however, only minor adaptations were necessary for use by the students in this study.

Training Tutors. The tutors were trained collectively by the researcher using

procedures for training handicapped tutors developed by Osguthorpe (1984). This training consisted of practicing four important tutoring techniques: 1) demonstrating the learning task, 2) prompting the tutee, 3) monitoring performance, and 4) giving praise and corrective feedback. Training of the tutors required two one-hour sessions during which the tutors practiced the tutoring skills under the supervision of the teacher's aide who had been trained using the training manual and tape supplement as well as by observing another teacher's aide training students to be tutors. Following the tutoring training, and before they could begin tutoring, each tutor was mastery checked by the aid on their tutoring skills.

Data Analysis

Multivariate analysis of covariance was used to statistically adjust for any pretreatment differences among the three treatment groups and the control group when analyzing posttest data. Because there was a total of 80 of the 124 participants for whom there was posttest data for each measure, the multivariate analysis of covariance was actually conducted on a subgroup of the participants. Consequently, it was necessary to perform individual analyses of covariance on each measure, including the total number of participants for whom there was data on each measure. The covariates used on posttest multivariate analysis of covariance including all five measures were selected based on their high correlation with the variables of interest as calculated with the MANCOVA. The covariates used on the individual analyses of covariance were the specific pretests which also had been found to be highly correlated with the respective posttest measures.

Upon first examination the multivariate procedure appeared the most conservative and appropriate procedure to use. However, since this procedure makes the assumption that any cases which do not include data on all variables should be excluded from the anlaysis and since there were only 80 of the 124 participants for whom there was pre- and posttest data on all five instruments, it was determined that univariate analyses of variance on each individual

measure were actually the more appropriate procedures to use.

It should be noted that the reason there were only 80 of 124 participants for whom there was posttest data on all five instruments was not because of attrition or data collection error. Rather, two specific problems arose during data collection. First, many younger and some older students experienced difficulty in either completing instruments or in completing them accurately. All of the LD students were read the instruments aloud. Many of them were given the instruments in a one-on-one fashion. While most of the LD students did not have difficulty, some appeared not to be concentrating and somewhat indiscriminant in their responses. Consequently, this data was discarded. These cases represent the majority of the missing data. A second problem was absenteeism which resulted in several participants not receiving one or two of the instruments. Therefore, individual analyses of variance were used in order to account for these problems. The acceptable level of statistical significance was determined at $p<.05$ for all analyses performed.

Pre-Treatment Attitudes.

In order to assess pre-existing social acceptnace attititudes as well as attitudes about school and learning, a study was conducted immediately prior to the implementation of the treatments in which the same sample of LD and regular class students were measured on the same set of instruments (Eiserman, 1986). The results indicated that LD and regular class students had positive attitudes about each other at a distance. However, this attitude did not seem to transfer into positive rapport with each other, as they did not choose the other kind of students on the Who's On Your Team measure as much as they chose students of their own kind. Further, younger students were more positive toward students of the other kind than were older students on the self-report measures. Another conclusion of the pre-treatment study was that LD students were significantly more confident about their general ability than were regular class students. This result was consistent with research

which indicated that LD students tend to overestimate their capabilities and status. Further, younger students were generally more confident and satisfied with school. Therefore, it was concluded that a need existed for improvements to be made in social acceptance attitudes as well as attitudes about school and learning.

Results

A summary of the post-treatment research hypotheses and questions and the respective results appears in Table 1.

Insert Table 1 about here

The multivariate analysis indicated that a significant difference between pre-treatment and post-treatment was found for all participants in the study, including those in the regular class control group, $F(6,45)=.507$, $p< .05$. In order to determine if this pre-post difference was represented similiarly in the regular class control group as well as all the treatment groups, two individual analyses were performed; one on the regular class control group and one on all of the treatment groups.

First, a univariate analyses of covariance conducted separately only on regular class control group participants indicated a significant difference between pre-treatment and post-treatment on three of the measures; Woodcock-Johnson total score, $F(1,9)=441.7$, $p<.001$; SPAS, $F(1,9)=20.46$, $p<.001$; and Attitudes About School, $F(1,9)=12.4$, $p<.01$. Second, multivariate analysis of covariance conducted on only treatment groups indicated a significant difference between pre-treatment and post-treatment on all six measures; Own Class Attitude, $F(1,66)=57.46$, $p<.001$; Attitudes About School, $F(1,66)=20.87$, $p<.001$;

Other Class Attitude, $F(1,66)=29.77, p<.001$; SPAS, $F(1,66)=64.4$, $p<.001$; Woodcock-Johnson, $F(1,66)=454.04, p<.001$; and the Who's On Your Team, $F(1,66)=5.28, p<.05$.

In order to address the second and third hypotheses pertaining to attitudes about school gains, gains made by the LD and regular class students in each of the treatments and control group were compared. The first multivariate analysis of covariance which included all five measures indicated no significant difference on the two measures pertaining to attitudes about school and learning. Because there was a total of only 80, of the 124 participants, for whom there was data for each measure, this initial multivariate analysis of covariance was actually conducted on a subgroup of the participants. Consequently, an individual analysis of covariance was conducted on the Attitudes About School measure including the total number of participants for whom there was data on the measure. This analysis of covariance indicated a significant difference between LD and regular class students, $F(1,87)=7.83$, $p<.01$. By examining the pre-treatment and post-treatment means and the univariate F-test in Table 2, it was found that regular class students scored signficantly higher than LD students on this measure. Further, a significant difference was found when testing kind by treatment interaction, indicating that at least one of the combinations of kind and treatment were significantly different from another combination of kind and treatment, $F(1,87)=3.73, p<.05$. Results of the Fisher's LSD analysis ($p< .05$) indicated that regular class students in treatment two experienced significantly greater gains than regular class control students and LD students in treatments one and three. This analysis also indicated that regular class students in treatment three experienced significantly greater gains than LD students in treatments one and three. Further, LSD analysis showed that while regular class students in treatment one did not experience a gain, the loss they experienced was significantly less than the loss experienced by LD students in treatment three.

Insert Table 2 about here

In order to address hypotheses four and five, peer acceptance attitudes of all of the LD and regular class students were compared. The analysis of covariance conducted on the Own Class Attitude measure indicated that there was a significant difference when testing kind by treatment interaction, $F(3,80)=3.53, p< .05$. Table 3 presents the pre-treatment, post-treatment and adjusted means, standard deviations and the univariate F-test for this measure. This analysis indicated that at least one of the combinations of kind and treatment were different from another combination of kind and treatment. Results of the Fisher's LSD analysis ($p< .05$) indicated that Regular class students in treatments one, two, and three and LD students in treatment one experienced significantly greater gains than LD students in treatment three. Further, this analysis showed that Regular class students in treatment three also experienced significantly greater gains than LD students in treatment two.

Insert Table 3 about here

Neither the multivariate analysis of covariance conducted on all of the measures, nor the individual analyses of covariance found a significant difference due to treatment, kind or grade group on the Other Class test or on the Who's On Your Team measure.

LD students and regular class students in each of the treatment groups and control group were compared next on their reading gains in order to address the sixth hypothesis dealing with reading achievement. The multivariate analysis of covariance conducted on the Woodcock-Johnson showed that there was a significant difference between LD and regular class students on at least one of the subscales, $F(3,90)=.121, p<.01$. The results of the

univariate analysis indicated that the Regular class students experienced a significantly greater gain than LD students on the passage comprehension subscale, $F(1,92)=10.78$, $p<.001$. There were no significant differences between LD and regular class students on the other two subscales.

The multivariate analysis of covariance conducted on the Woodcock-Johnson also showed that there was indeed a significant difference between treatments on at least one of the subscale, $F(9,246)=.272$, $p<.05$. When examining the results of the univariate analysis it was found that there was a significant difference due to treatment on the Passage Comprehension subscale, $F(3,82)=4.22$, $p<.01$. There were no significant differences on the other two subscales due to treatment. Subsequently, a significant interaction was found when testing kind by treatment interaction on the Passage Comprehension subscale, $F(9,246)=.249$, $p<.05$. Table 4 presents the results of the multivariate analysis of covariance testing kind by treatment interaction on the Woodcock-Johnson. When examining the univariate F-test, it was found that there was a significant difference when comparing at least one combination of kind and treatment with another combination of kind and treatment on the passage comprehension subscale, $F(3,82)=4.3$, $p<.01$. Results of the Fisher's LSD analysis ($p<.05$) indicated that regular class students in treatment one and treatment two experienced significantly greater gains than all of LD students in the study. Further, regular class students in treatment 3 and the control group experienced significantly greater gains than LD students in treatments two and three.

Insert Table 4 about here

The multivariate analysis of covariance on the difference between the Other Class measure and the Own Class measure indicated a significant difference when testing the

interaction between category and kind, $F(1,73)=5.69$, $p<.05$. The results of a subsequent Fisher's LSD analysis ($p< .05$) indicated that Regular class older students experienced a greater difference between their Other Class and their Own Class attitudes scores than the regular class younger students and the LD younger and older students.

Post-treatment Conclusions

Social attitudes

The first hypothesis that was tested by this study was: Regular class and LD students who are in one of the three treatment groups will experience significant gains in attitudes about school and in social acceptance of the other kind of students while regular class control students will not experience significant attitudinal gains. This hypothesis was addressed by the least stringent procedures used in the analysis. The results indicated a significant difference between pretreatment and posttreatment, multivariately, for all treatment groups and the control group. Individual analyses on the control group and on the combined treatment groups found that this pre/post difference was largely due to gains made by the treatment groups. The treatment groups experienced significant gains on all of the measures while the control group experienced significant gains on only the SPAS, Attitudes About School and Woodcock-Johnson measures. This finding is important because it indicates that all three treatments were generally beneficial to the students with respect to attitudes about school and learning and with respect to attitudes about each other. As was expected, the regular class control students did not experience significant gains on the two measures pertaining to social acceptance of LD students. One conclusion which can be made, then, is that all three tutoring treatments produced significant gains which were similiar on all of the measures and that regular class students who did not experience any of the tutoring treatments did not experience an increase in social acceptance of LD students.

While it was hypothesized that all of the treatments would produce gains, the most

rigorous questions which were tested by this study pertained to the difference in gains made between treatments. Hypotheses two, three, four, five and six were tested by the most conservative and stringent methods used in the study. The post-treatment results of analysis performed on all five instruments combined indicated that there were no differences due to treatments or to any other of the dependent variables specified in the study. Because this analysis procedure is statistically very conservative, it caused a rather substantial reduction in the number of students whose data could be included in the analysis. Consequently, it is questionable these results were as accurate as the results obtained by further analyses conducted on each of the instruments separately. These individual analyses addressed hypotheses pertaining to differences due to treatment and other dependent variables of interest.

As can be noted in Table 1, the fourth and fifth hypotheses were not supported by the results as no significant difference due to treatment was found on the Student Attitudes Questionnaire when adminstered about the other kind of students or on the Who's On Yóur Team test. Significant differences due to kind by treatment interaction were found, however, on the Student Attitudes Questionnaire which was administered about students of their own kind. Regular class students in treatments one, two and three and LD students in treatment one increased in their liking of their own kind of students significantly more than LD students in treatment three. Regular class students in treatment three increased their liking toward other regular class students significantly more than LD students in treatment two.

One possible explanation for the regular class students' increase in liking of other regular class students pertains to self concept. When the students were nominated for involvement in the tutoring program, teachers were requested to provide names of students needing reading help. However, teachers mentioned that many of the students they nominated also

needed experiences to enhance self-esteem. Previous research has suggested that social status and social comfort are closely related to self-esteem. Further, as Osguthorpe et al. (1985) has shown, tutoring experiences can enhance both self-esteem and social acceptance. It is possible that the self-confidence obtained from the tutoring experience transferred into social comfort with students of their own kind and was manifested in the regular class students' increase in liking other regular class students. It is important to note that the regular class control group did not experience this increase which further indicates that the tutoring experience may enhance a general feeling of comfort with peers of their own kind.

LD students in treatment one also experienced a significant increase in liking other LD students when compared to LD students in treatment three. One possible explanation for this difference is that the reciprocal tutoring (treatment three) may have been more socially demanding, since the LD students were expected to change roles every other day. Consequently, it is possible self-confidence was not built for LD students in treatment three as it seems to have been the case for LD students in treatment one.

One issue raised in the literature pertained to the development of self-confidence and age. The third research question addressed by this study was: What differences in the effects of tutoring can be noted when comparing the experience of older students with younger students involved in the study? The difference between attitudes toward students of the other kind and attitudes toward students of their own kind is one area where significance was found. Older regular class students who were in one of the three treatment groups expressed a difference between their attitudes toward LD students and their attitudes toward other regular class students. This difference for the older regular class students was significantly greater than the same kind of difference expressed by younger regular class students, older LD students or younger LD students, all of whom were in one of the three treatment groups. This finding indicated that the older regular class students expressed a difference in their

attitudes between the two kinds of students; a difference which did not exist prior to the tutoring experience. Perhaps the tutoring experience accentuated a difference between LD students and other regular class students of which the older regular class students had not been aware prior to the tutoring experience.

Previous research (Goodman, Wilson & Bonstein, 1972; Gottlieb & Budoff, 1973) has indicated that after initial experiences with handicapped people, non-handicapped people often become more negative than they were. With extended periods of time, however, this is compensated for and social acceptance increases significantly. Perhaps this finding suggests that the time required to improve social acceptance with older regular class students is greater than the time required with younger regular students. This finding also indicates that a greater difference between older regular class students' attitudes about other regular class students and LD students exists and should be the focus of both future research and special programs in schools.

Attitudes About School

The second and third hypotheses that were tested were tested with individual univariate analyses which is a statistically less stringent method than the multivariate procedure previously discussed. However, it was felt that this procedure was appropriate because it included all of the available data while still remaining fairly conservative.

The results of the Attitudes About School measure did not support these hypotheses. Rather, while students as a whole experienced a gain on this measure, as was previously discussed, all of the LD students experienced a loss rather than a gain on this measure; the greatest loss made by those in treatment three with the least loss made by those LD students in treatment two. It is difficult to be certain why this occurred. Pretreatment findings suggest that with age or length of time in school, increases on this variable might be expected. Further, previous research has indicated that peer tutoring experiences, such as any of these

three types, lead to more positive attitudes about school and greater insight about learning processes.

In light of the pretreatment findings and results of previous research, then, there are two possible explanations for why LD students experienced loss rather than gains on the Attitudes About School measure. First, it is possible that the LD students were all experiencing a similar tendency which would result in a loss as indicated with this measure. The differences, then, could be accounted for not in terms of damage done by the three treatments, but the degree to which a negative attitude or loss in insight was prevented. If this is the case, it is not difficult to understand why treatment two produced the best effect. With this treatment, the LD students were engaged in a unique activity which they enjoyed and successfully accomplished. This circumstance is likely to be the most encouraging to the LD students. Further, because the LD students in treatment two were in tutor roles, it is most likely that insight about learning processes were retained. A possible explanation for why treatment three was least beneficial to the LD students is that it required the students to change roles from tutor to tutee every other day. The qualitative data which was collected indicated that the LD students appeared to be confused occasionally, due to the daily changes in their role. Rather than making the learning process a more understandable event, it became more blurred. Furthermore, it was frustrating to a number of the LD students to switch from sign language tutoring, which they enjoyed most, to reading tutoring, which they did not enjoy as much. The dissatisfaction from this may account for the difference between LD students in treatment three and LD students in treatments one and two.

The second possible explanation for why LD students experienced losses on the Attitudes About School measure is that the treatments were indeed harmful to the LD students' attitudes about school. Previous research indicated that tutoring was beneficial to LD students in providing insight on learning processes (Top, 1984). Differences inherent to

this study (which were, essentially, that three different types of tutoring were occurring simultaneously) may have added an element to the tutoring treatments which caused a negative effect for LD students. In either case, it can be concluded that LD students benefit most with respect to attitudes about school by being the tutor of sign language and least from experiencing reciprocal tutoring.

The results pertaining to the regular class students also did not support the second and third hypotheses. Rather, these results were precisely the opposite of that which was expected. These findings indicated that regular class students in treatment two benefitted the most, followed by treatments 3 and 1 and the control group accordingly. Further, regular class students in treatments two and three experienced gains significantly greater than gains made by LD students in treatments one and three. While regular class students in treatment one experienced a loss, it was, however, significantly less of a loss than that experienced by LD students in treatment three. Interestingly, the regular class students benefitted most from treatment two, just as did the LD students. This may suggest that the content of the tutoring (sign language) may have been the dominant effect of the treatment rather than the individual roles which were acquired by the students. This notion can be argued further because if content was the main determinant, it would be expected that treatment three (where sign language was the content half of the time) would have been the second most powerful effect, as was the case. Perhaps, the ways in which sign language was taught and learned provided both the regular class and LD students an experience which lent itself to improved attitudes about learning and insight into the learning process. This notion supports previous findings (Osguthorpe et. al., 1985) which suggest that when academically deficient students were given a completely new subject to learn (sign language), they begin to take risks in learning and may, in fact, become more aware of how they learn and their abilities to learn something new.

Another interesting finding was that the regular class control students experienced a loss which was significantly less than the gain made by regular class students in treatment two. This finding suggests that regular class students who are not given new learning experiences which place them in different learning roles, will grow less insightful about learning processes and experience a decrease in positive attitude about school and learning. Thus, it can be concluded that treatment two (LD students tutoring regular class students in sign language) resulted in the most significant gains in attitudes about school for regular class students, followed by treatments three and one.

Reading Ability

The sixth hypothesis that was tested by this study was: LD and regular class students in treatment one will demonstrate the most significant increase in reading ability, while students in treatment three will demonstrate the second most significant increase, and students in treatment two and the control group will demonstrate the least significant increase in reading ability. The results of the Woodcock-Johnson measure indicated that regular class students scored significantly higher than the LD students. This was an expected outcome mainly because the LD students were known to have severely delayed reading abilities. There was also a significant difference due to kind by treatment interaction; regular class students in treatments one and two experienced significantly greater gains on the passage comprehension subtest than all of the LD students in the study. Further, regular class students and the control students scored significantly higher than LD students in treatments two and three.

These results support the sixth hypothesis partially inasmuch as the regular class students in treatment one scored higher than all of the rest of the students. This finding supports previous research (Top, 1984) which indicated that academically deficient tutors of reading would experience significant improvement in reading skills. Interestingly, however, Top found reading gains made on the Word Attack subtest rather than the Passage

Comprehension subtest. It would be expected that significance would be found on the Word Attack subtest because it is a more basic skill and, further, is a prerequisite to passage comprehension skills. However, this study's finding is interesting because of the nature of the reading tutoring which occurred. Tutoring logs indicated that much of the tutoring time was devoted to passage comprehension exercises rather than word attack. Thus, it is understandable why such gains were made.

Why regular class students in treatment two also experienced significant gains in passage comprehension is not understood. It is possible these students received supplemental reading assistance or that they were qualitatively different in their reading abilities which were not identified on the pre-test. Lack of documentation of such information makes firm conclusions difficult to draw.

The sixth hypothesis was also partially supported. LD students in treatment one experienced greater gains than the other LD students, followed by LD students in treatment three and two accordingly. This finding also supports the research of Top (1984) which indicated that the recipients of reading tutoring by academically delayed tutors would experience significant gains. This case is different from Top's findings, however, because regular class students were tutoring LD students whereas Top used the inverse tutoring configuration. Again, Top's research indicated gains on the Word Attack and the Passage Comprehension subtests rather just on only Passage Comprehension. However, gains in passage comprehension are the most desirable as the other subscales are only prerequisite skills to passage comprehension.

It is difficult to determine the reasons why students in treatments two and three, as well as the control group, experienced gains of various degrees in passage comprehension. However, the main focus of hypothesis six should be that those students who did experience treatment one experienced reading gains, which was the case. This finding is important

because it demonstrates the benefit of peer tutoring in the classroom. While some teachers and parents may be reluctant to believe that peer tutoring in reading can benefit both the tutor and the tutee, this finding contributes to the research supporting this notion.

Summary

Several conclusions have been drawn from this study. Pre-treatment findings showed that LD and regular class students had positive attitudes about each other at a distance. However, this positive attitude did not seem to transfer into positive rapport with each other, as they did not choose the other kind of students on the team test as much as they chose students of their own kind. This suggests that they did not feel as comfortable actually interacting as they might have. Another pre-treatment conclusion which was drawn was that LD students tended to overestimate their social acceptance, choosing the regular class students to be on their team more than the regular class chose them. Younger students were also more positive toward students of the other kind than were older students on self-report measures. However, because this difference between younger and older students was not manifested on the team choice measure it was possible that the younger students held a distant liking for the other kind of students, but, nevertheless, felt uncomfortable with them. These findings suggested that mental attitude and social rapport can function separately. A further pre-treatment conclusion was that LD students were significantly more confident about their general ability than were the regular class students. This finding may be due to overestimation (a tendency found in LD students' self-perceptions) or a response to recent programs aimed at improving LD students' academic self-esteems. A final pre-treatment conclusion was that younger students were generally more confident, satisfied with school, and perceived themselves as neater than older students. This suggested that with age or length in time with school, students may become less confident and satisfied in these areas.

Post-treatment findings have shown that all three tutoring configurations led to attitudinal improvements regarding school and social acceptance. It was also concluded that the three tutoring treatments are likely not to produce different attitudinal effects. Further, these supplementary tutoring treatments may not produce effects which are significantly different from effects produced by normal classroom experiences. However, several effects due to the treatments and other independent variables in the study were identified. Regular class students who were tutored by LD students in sign language as well as those LD students who served as tutors experienced the greatest benefit regarding attitudes about school and learning. Another conclusion was that the regular class students involved in any of the tutoring configurations experienced an increase in self-confidence which was transferred into enhanced social confidence with other regular class students. The finding was similar for LD students, however, it was found that reciprocal tutoring (treatment three) was especially socially challenging to the LD students. Consequently, few social benefits were apparant. Another post-treatment conclusion which was drawn was that more time may be required to improve social acceptance with older regular class students than with younger regular class students or with any of the LD students. Lastly, and in support of previous research findings, both tutors and tutees of reading experienced reading gains.

From both the quantitative and the qualitative data which was collected for means of treatment verification, suggestions for improving future peer tutoring programs were formulated. Those recommendations include the following:

1. It is best for LD students to be given one role in a tutoring relationship and not to vary from day to day. Results of this and previous research have indicated that LD students functioning as tutors benefit both attitudinally as well as academically in the subject being tutored. It appears that stable tutor/tutee roles are best for LD students and that reciprocal tutoring would not be advantagous.

2. This study's findings also supported those of previous research (Eiserman & Osguthorpe, 1985) indicating that total class tutoring is an effective strategy for peer tutoring programs. There are two main challenges in the implementation of total class tutoring. First, it is vital that enough supervision is given the students so as to assure that they are kept on task and are advancing only after demonstrating mastery. The results have indicated that two adults, trained in the tutoring procedures, can adequately supervise 15 pairs of tutors tutoring one subject.

The second challenge pertains to materials. While it is often best to use materials especially designed for peer tutoring programs, occasionally adaptations of such materials or other kinds of materials require special preparations to be made. It is difficult to guage individual progress of a number of students, therefore, it is vital that materials be made prior to implementation. Once these materials are prepared they must be organized in a fashion where students are able to use and maintain the system themselves. Individual folders for each tutoring pair help them to keep track of their progress as well as for the teacher to monitor their activities.

3. While it has been shown that LD students will have a better experience by functioning as the tutor regularly, rather than switching roles, it is also important that the program be designed so that after a period of time, the LD students can switch tutees. This and previous research found that after approximately six weeks of tutoring three times a week, both the tutors and tutees began requesting new tutoring partners.

Thus, the results of this study support the claim that LD and regular class students should be placed together in peer tutoring programs in the schools. From such programs all students can experience social benefits as well as significantly improved attitudes about school.

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Table 1
Summary of the Post-Treatment Research Hypotheses and Questions and the Respective Results

Hypothesis or Question	Result
Hypotheses	
One: Regular class and LD students who are in one of the three treatment groups will experience significant gains in attitudes about school and in social acceptance of the other kinds of students while regular class control students will not experience significant attitudinal gains.	Significant differences were found for all treatments and the regular class control group. Treatment groups experienced significant pre-post differences on all measures while the regular class control group experienced pre-post differences on the Woodcock-Johnson SPAS and Attitudes About School measures.
Two: When comparing LD students in treatments one, two and three, those who experience treatment three will demonstrate the most significant increase in positive attitude toward school, while students who receive treatment two will demonstrate the second most significant increase and those who experience treatment one will demonstrate the least significant increase as measured by school attitude tests.	On the Attitudes About School measure, Reg.Treat.1> Reg. Control, & LD Treat. 1 and 3. Also, Reg. Treat. 3 > LD Treat. 1 and 3. Also, Reg. Treat. 1 > LD Treat. 3. For the SPAS measure, a kind x school interaction was found for two of the subscales.
Three: Regular class students who experience treatment three will demonstrate the most significant increase in positive attitude toward school, while students who receive treatment one will demonstrate the second most significant increase and those who receive treatment two will demonstrate the least significant increase as measured by school attitude tests, when compared with regular class students who do not experience any kind of tutoring.	

continued.

Hypothesis or Question	Result
Hypotheses	
Four: When comparing LD students in treatments one, two and three, those who experience treatment three will demonstrate the most significant increase in peer attitude acceptance, while students who receive treatment two will demonstrate the second most significant increase and those who experience treatment one will demonstrate the least significant increase as measured by attitude instruments.	Reg. Treat.1, 2, 3 & LD Treat.1 > LD Treat. 3. Also, Reg. Treat. 3 > LD Treat. 2.
Five: Regular class students who experience treatment three will demonstrate the most significant increase in peer attitude acceptance while students who receive treatment one will demonstrate the second most significant increase and those who receive treatment two will demonstrate the least significant increase as measured by attitude instruments, when compared with regular class students who do not experience any kind of tutoring.	No other significant differences were found due to treatment or kind on either the Other Class or Who's On Your Team measure.
Six: LD students and regular class students in treatment one will demonstrate the most significant increase in reading ability, while students in treatment three will demonstrate the second most significant increase, and students in treatment two and four will demonstrate the least significant increase in reading ability.	Reg. Treat.1 & 2 > all LD students. Also, Reg. Treat. 3 & Reg. Class Control > LD Treat. 2 & 3.
Question	
One: What differences in tutor/tutee relationships can be noted when comparing the experience of the older students with the younger students involved in the study?	Regular class older students experienced a greater difference between their Other Class and their Own Class Attitudes scores than the regular younger students and the LD younger and older students.

Table 2

Analysis of Variance of Kind by Treatment on Attitudes About School Gain Scores

Pretest, Posttest, and Adjusted Mean Scores and Univariate F-tests of Significance

Variable	Group	Pre M	Pre SD	Pos M	Pos SD	Adj.M	N
Treatment 1	LD	3.02	.532	2.61	.422	2.58	12
	Regular	2.77	.496	3.43	.717	2.80	17
Treatment 2	LD	2.77	.633	2.77	.360	2.80	11
	Regular	2.95	.534	2.96	.323	2.94	17
Treatment 3	LD	2.54	.394	2.45	.530	2.53	13
	Regular	3.05	.438	2.98	.380	2.94	18
Control	LD	----------					
	Regular	2.96	.511	2.71	.462	2.69	15
grouped	LD	2.77	.546	2.60	.455	2.63	41
grouped	Regular	2.93	.516	2.77	.447	2.85	68

Effect	F
Kind	7.83*
Kind x Treatment	3.73**

*p<.01

**p<.05

Note. Due to attrition of degrees of freedom when using the full model, it was necessary to calculate the analysis of variance by kind in a separate analysis with kind as the only effect.

Table 3

Analysis of Variance of Treatment by Kind on Own Class Attitude Gain Scores

Pretest, Posttest, and Adjusted Mean Scores and Univariate F-tests of Significance

Variable	Group	N	Pre M	Pre SD	Pos M	Pos SD	Adj.M
Treatment 1	LD	15	2.95	.308	3.72	.562	3.75
	Regular	17	3.09	.158	3.58	.554	3.58
Treatment 2	LD	12	3.03	.308	3.44	.643	3.45
	Regular	17	3.01	.195	3.71	.544	3.72
Treatment 3	LD	14	3.09	.262	3.13	.452	3.12
	Regular	17	3.10	.195	3.74	.555	3.73
Treatment 4	LD.....						
	Regular	17	3.17	.252	3.38	.751	3.37

Effect	F
Kind	4.0022**
Treatment x Kind	3.5344*

**p<.05

*p<.01

Note. Due to attrition of degrees of freedom when using the full model, it was necessary to calculate the analysis of variance by kind in a separate analysis with kind as the only effect.

Table 4

Multivariate Analysis of Covariance of Kind by Treatment Interaction on the Woodcock-Johnson Posttest

Multivariate Analysis of Covariance

Type of Test	Value	Hypoth. df	Error df	Sign. of F
Hotelling's T^2	.24925	9.0	236	.024
Wilk's Lambda	.79246	9.0	194	.026

Pretest, Posttest, and Adjusted Gain Scores and Univariate F-tests of Significance

Variable	Group	N	Pre M	Pre SD	Pos M	Pos SD	Adj.Gain
Subscale: Passage Comprehension							
Treatment 1	LD	15	146.20	13.12	150.27	10.60	.949
	Regular	15	160.80	6.55	163.47	7.12	4.91
Treatment 2	LD	15	151.80	12.03	151.47	9.80	-1.42
	Regular	17	160.06	6.29	163.47	7.12	4.60
Treatment 3	LD	16	148.56	9.81	150.50	10.77	.043
	Regular	19	160.38	6.61	162.47	5.78	3.93
Treatment 4	LD.....						
	Regular	16	160.38	10.45	162.44	6.75	3.91

Effect	F
Kind	10.778**
Treatment x Kind	4.3034*

*p<.01 **p<.001

Peer Acceptance of Learning Disabled Elementary Students

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Running Head: Peer Acceptance of LD Students

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Abstract

The purpose of this study was to assess the attitudes of LD students and their regular class peers using multiple attitude measures in several different schools where LD students were placed in self-contained classes. Further, attitudes toward school and learning were assessed for both LD and regular class students. A total of 52 LD students (all of the students in all four self-contained classrooms) participated in the study. Of these 52 students, 22 were in Kindergarten through third-grade classrooms while 30 were in fourth through sixth-grade classrooms. Additionally, 72 regular class students, all of the low functioning readers in the four schools, were indentified to be included in this study. Of these 32 were in third-grade while 40 were in fifth- grade classrooms. Results indicated no difference between LD students' attitudes toward other LD students and their attitudes toward regular class students. Similarly, no difference was found between regular class students attitudes toward other regular class students and their attitudes toward LD students. Further, there was no difference between regular class students' attitudes and LD students' attitudes toward each other. Younger students were more accepting of students of the other kind and had more positive attitudes about themselves as learners. LD students were more confident about themselves as learners than were regular class students.

Peer Acceptance of Learning Disabled Elementary Students

The influence of peer attitudes increases markedly during the elementary school years and becomes more important than teacher attitudes (Reid, 1984). Because gaining peer acceptance is one of the primary needs of children approaching adolescence, LD children may be severely affected by negative peer attitudes. However, it is uncertain whether regular class students have negative attitudes toward their LD peers. Table 1 summarizes empirical studies which have examined social attitudes between LD and regular class students. While all of the studies reviewed found that LD students experience some degree of social maladjustment, some of the conclusions drawn from these studies are contradictory.

In a study examining the interactions between LD and regular class students, researchers examined social relationships between third-, fourth- and fifth-grade LD children and their regular class peers (Bryan, 1974) and found that LD children were not accepted and were, in fact, rejected by their regular class peers. Additionally, the regular class students viewed the LD children as scared, unhappy, worried and, generally, children who are not desirable playmates. In a similar study Garrett and Crump (1980) found that LD students were preferred less frequently and, thus, were found to have significantly lower social status than the regular class students.

As can be seen in Table 1, not all studies have indicated completely negative results pertaining to social acceptance of LD children. Miller (1984) examined the degree of social acceptance of LD children compared to regular class students and students with other handicapping conditions. He found LD students to be less socially accepted than regular class children, although attitudes toward LD children were more positive than toward children with other handicaps. This study, however, elicited attitudes about hypothetical cases rather than attitudes toward specific, real people known to the respondents as did the former two studies by

Bryan (1974) and Garrett and Crump (1980). Consequently, it may be inappropriate to compare these two sets of results.

Results of studies suggesting that LD children's degree of social acceptance is less negative than reported in previous years were confirmed by other studies using such instruments eliciting attitudes toward specific individuals. In their study, Siperstein, Bopp, and Bak (1978) found that LD students were significantly less popular than regular class students. However, they also determined that while LD students were never among the most popular, their incidence among the isolates was similar to regular class students. These results confirm Bryans' results that LD children are not as popular as regular class students, however, they do not indicate LD children are rejected, as Bryan concluded. Rather, Siperstein et. al. concluded that children with academic problems are socially hampered, although not necessarily rejected. Further, they suggest that the greater the LD children's strengths in other areas, such as athletics, the greater their chances are of being more socially accepted. Thus, an LD child's attributes which may have little to do with their handicap may have much to do with their degree of acceptance by their peers.

The LD children's influence on their social acceptance was the focus of an observational study of third-, fouth- and fifth-grade LD students which indicated that LD children emit significantly more competitive statements than non-LD children (Bryan, Wheeler, Felcan & Henek, 1976). Inversely, the non-LD children were found to be the recipients of significantly more statements showing consideration from peers. Interestingly, correlational analysis of their data indicated that being nice may elicit niceness in others and competitiveness elicits competitiveness in others. As Siperstein et al. suggest that positive attributes may contribute positively toward LD children's social acceptance, Bryan et al. have shown similarly that LD children's negative attributes contribute negatively to their social acceptance. Thus, social acceptance is not simply an issue of regular class students' attitudes; LD's children's behavior

is also a variable for consideration when studying social acceptance of LD children.

Three studies, however, have reported results which are inconsistent with those previously mentioned. First, The results of a study of 362 elementary students indicated that LD children were not rated significantly lower in popularity than their regular class peers (Prillaman, 1981). Further, Prillaman found that while LD children were as well accepted as regular class students, they were found to be significantly over-represented in the isolation category. The reason for the inconsistency between these results and those of Siperstein et. al. (1978) are not clear. Prillaman suggests that it is important not to interpret isolation as rejection. It may, in fact, indicate that a child is regarded neither negatively nor positively, but in a neutral way. Prillaman also suggests that recent awareness in learning disabilities and special programs for LD populations may explain the improved attitude. In another study conducted by Sainato (1983), similar results were found showing no significant differences between social acceptance of LD and regular class children, which may further substantiate that improvements have been made. Nevertheless, even in these studies which have indicated more positive results regarding social acceptance of LD children, it was still apparent that LD children experience some kind of social maladjustment which must be studied further.

Various explanations have been offered regarding the nature of this maladjustment. Garrett and Crump (1980) found no significant differences in social acceptance between LD students and regular class students; although the LD students tended to overestimate their social status while regular class students did the converse. This may support the claim of Siperstein et al. (1978) that the LD students' attribute of self-confidence evidenced in their overestimating of their social status may actually enhance their social acceptance. Bruininks (1978) also showed that LD children are less accurate than their regular class peers in assessing their own social status. However, Bruininks found that peer social acceptance of LD students in mainstream programs was significantly less than that of regular class students. The findings of another

study further complicate the issue, as Horowitz (1981) found that while LD children were less popular than their normal peers, they were no less insightful about how others regarded them. Perhaps Horowitz's finding is consistent with that of Garrett and Crump inasmuch as LD children are no less insightful, however LD children over-estimate their status while regular class students underestimate their own status.

One of the problems in interpreting these findings is in understanding the meaning of the label "LD" across studies. Students with various degrees of handicapping conditions have been labeled "LD". In the Colorado Learning Disabilities Study, Davis and Smith (1984) found that there was a striking difference in the characteristics of children labeled "LD". Among them were children who were slow learners, emotionally disturbed, and below average achievers (in high achieving districts). Thus, one possible explanation for the discrepent findings of the studies reviewed above is the nebulous use of the term "LD".

One of the strengths of the Bryan et al. (1976) study is that it emphasized observing actual behavior, rather than hypothetical, anticipated or expressed behavior as used in the other studies mentioned earlier (Bryan, 1974; Garrett and Crump, 1980; Siperstein et. al., 1978; Prillaman (1981); Sainato (1983). It is important to note that actual behavior may differ from verbally expressed behavior. The results of a study of 34 LD and regular class children indicated that LD children were of lower status than their non-LD peers, and that regular class children actually play with approximately one-half of the LD children they express a liking toward (Levy and Gottlieb, 1984). This does not necessarily suggest that the conclusions of the previously mentioned studies are inaccurate, but that a richer description of social acceptance may be obtained by observing actual behaviors as well as expressed behaviors. Consequently, possible discrepancies exist between each of these studies, such as the degree of social rejection as pointed out between the Bryan and Siperstein study and the question raised here pertaining to the degree of accuracy of expressed social behaviors and the difference between attitudes toward

a hypothetical group of individuals and attitudes toward specific individuals known to the respondents. It is likely these two measurement approaches, by their very natures, assess two different constructs and, thus, may have contributed to some of the disparity in these findings. Despite the contradictions, each of the studies indicated that LD students experience some form of social acceptance deficiencies.

Statement of Purpose

The purpose of this study was to assess the attitudes of LD students and their regular class peers using multiple attitude measures in several different schools where LD students were placed in self-contained classes. Further, attitudes toward school and learning were assessed for both LD and regular class students. With respect to questions pertaining to social acceptance, it was hypothesized that LD students would demonstrate a more positive attitude toward other LD students than toward regular class students and that regular class students would demonstrate a more positive attitude toward other regular class students than toward LD students. Further, it was hypothesized that LD and regular class students would demonstrate similar attitudes toward each other. Regarding attitudes about school and learning, it was hypothesized that LD students would demonstrate a less positive attitude toward school and learning than regular class students.

Methods

Students

Students selected for the study were enrolled in four schools in the Davis School District, north of Salt Lake City. The people of the area were predominantly middle-class caucasion with light industry and agricultural occupations. Four schools in the district with self-contained learning disabled (LD) classrooms, were included in the study. A total of 52 LD students (all of the students in all four self-contained classrooms) participated in the study. Of these 52 students, 22 were in Kindergarten - third-grade classrooms while 30 were in fourth -

sixth-grade classrooms. Additionally, 72 regular class students, all of the low functioning readers in the four schools, were indentified to be included in this study, as well as a follow-up study to improve peer social acceptance and reading skills through peer tutoring. Rather than randomly selecting the regular class students, all students whose reading abilities suggested that peer tutoring would benefit were chosen. Teachers' inferential self-concept ratings on these students indicated an equal respresentation of students with respect to degree of populatity, self-esteem and attitudes about school. Of the 72 regular class students, 32 were in third-grade classrooms while 40 were in fifth-grade classrooms.

Instruments

Four instruments were administered to all of the students in the three treatment groups as pretest and posttests: one standardized self-attitude test (Student Perceptions of Ability Scale), and three measures of attitude toward school or classmates (Student Attitudes Questionnaire, Attitudes About School, and the Who's On Your Team Test). The SPAS instrument is comprised of 70 statements about which the student determines to be "un-like" or "like" himself or herself. This instrument was used to determine differences in academic self-esteem between the LD and regular class students. This instrument has been used widely in elementary schools. Estimates of internal consistency were reported using Cronbach's alpha (.915). Test-retest reliability data were collected resulting in a stability coefficient for the full SPAS at .834. The Students Attitudes Questionnaire includes a list of 20 adjectives and 14 short phrases which are used at the end of the question, "How much are the students in _____'s class...?" For each of the adjectives the student responds on a five point scale which illustrated as follows: all, some, no much, or none of the time. The Attitudes About School instrument consists of eight questions pertainig to attitudes about school and uses the same scale described for the Students Attitudes Questionnaire. Four tests of reliability were performed on the Attitudes About School and Student Attitudes Questionnaire on each of group of students in the study; LD, regular

class, younger and older. The internal consistency full scale Chronbach's alpha ranged from .80 to .95. The Who's On Your Team instrument was designed to focus on social distance choice behavior between students in elementary school. This instrument required each student to list, in rank order, five students wanted on his/her team. While this measurement technique was not tested for reliability, a number of previous studies which have used the technique have reported confidence in it (Bryan, 1974; Garrett & Crump, 1980; Prillaman, 1981).

Data Analysis

Because there was a potential for many different relationships between variables and since the data included simultaneous measurements on many variables of interest, a multivariate analysis was used. (Johnson and Wichern, 1982). Two sets of analyses were performed. First, data were analyzed using multivariate analysis of variance followed by repeated one-way analysis of variance. Because there were only 98 of the 124 participants for whom there was data for each measure on the pretest, the multivariate analysis of variance was actually conducted on a subgroup of the participants. Consequently, it was necessary to perform individual analyses of variance on each pretest measure, including the total number of participants for whom there was data on each measure.

Upon first examination the multivariate procedure appeared the most conservative and appropriate procedure to use. However, this procedure makes the assumption that any cases which do not include data on all variables be excluded from the anlaysis. Since there were only 98 of the 124 participants for whom there was data on all four instruments (which meant 26 participants would be excluded in the multivariate analysis), it was determined that univariate analyses of variance on each individual measure were actually the more appropriate procedures to use.

It should be noted that the reason there were only 98 of 124 participants for whom there was data on all four instruments was not because of attrition or data collection error. Rather,

two specific problems arose during data collection. First, many younger and some older students experienced difficulty in either completing instruments or in completing them accurately. The experimenter read aloud the instruments to all LD students administering the insruments in a one-on-one fashion to many of them. While most of the LD students did not have difficulty, some appeared to be not concentrating and somewhat indiscriminant in their responses. Consequently, this data was discarded. These cases represent the majority of the missing data. A second problem was absenteeism which resulted in several participants not receiving one or two of the instruments.

Results

The findings will be reported in two separate parts: 1) results from the multivariate analysis of variance on all five attitude measures; and 2) results of individual analyses of each attitude measure. These findings will be reported with respect to the specific hypotheses which they addressed.

Hypothesis One and Two. 1) Prior to treatment, LD students will demonstrate a more positive attitude toward other LD students than toward regular class students as measured by social attitude instruments; and 2) Prior to treatment, regular class students will demonsrate a more positive attitude toward other regular class students than toward LD students as measured by social attitude measures.

The univariate analysis of variance comparing pre-test scores on the Other Class and Own Class Attitude measures indicated no significant difference between the two tests for either the LD or the regular class students. Therefore, hypotheses one and two were determined to have not been confirmed.

Hypothesis Three. Prior to treatment, LD and regular class students will demonstrate similar attitudes toward each other as measured by social attitude instruments.

No significant difference was found on either the multivariate or univariate analysis of

variance between the LD and regular class students nor on the interaction between grade group and kind. Consequently, it was determined that LD and regular class students did indeed have similar attitudes toward each other.

Hypothesis Four. Prior to treatment, LD students will demonstrate a less positive attitude toward school and learning than regular class students as measured by school attitude tests.

The first multivariate analysis of variance on the attitude measures showed no significant difference between LD and regular class students. However, the second set of pre-treatment findings, which included all of the data on each measure, indicated there was a difference between LD and regular class students' attitudes about school. The multivariate analysis of variance conducted on the SPAS subscales showed a significant difference between LD and regular class students, F (6, 110)= .148, p<.01. Further univariate analysis on the subscales showed that only one subscale, Confidence was significantly different, F(1,115)= .193, p<.05. indicating that LD students scored significantly higher than the regular class students. Table 2 summarizes the findings of the multivariate analysis of variance and univariate F-tests of significance on the SPAS subscales where difference between LD and regular class students was tested.

Question One. Prior to treatment, is there a difference between the younger students and the older students in social attitudes as measured by social attitude measures?

The first multivariate analysis of variance on the attitude measures showed a significant difference between younger and older students' performance. The multivariate test of significance indicated that a significant difference existed between the young and older students, F(5,91)=.234, p<.01, likely on at least one of the five attitude measures' mean scores. When examining the univariate F-test and younger and older students' means, it was seen that there

was a significant difference between the two groups on the Other Class pre-test $F(1,95)= 4.77$, $p< .05$. Further univariate analysis of variance including all of the existing cases on the Other Class pre-test also indicated a significant difference between younger and older students, $F(1, 114)=3.66$, $p< .05$.

Question Two. Prior to treatment, is there a difference between the younger students and older students in attitudes about school and learning?

The results of the analysis of variance on the Attitudes About School test indicated a difference between younger and older students, $F(1,114)=8.85$, $p< .01$. The means which are reported in Table 3 show that the older students scored higher than the younger students on the Attitudes About School measure. The analysis of variance also indicated a significant grade group by kind interaction, $F(1,114)=4.45$, $p< .05$. This interaction indicates that the difference between LD younger students and LD older students is significantly different from the difference between the Regular class younger students and the regular class older students. Specifically, there is a greater difference due to age for the regular class students than for the LD students.

The first multivariate analysis of variance on the attitude measures showed a significant difference between younger and older students' performance. The multivariate test of significance indicated that on at least one of the five attitude measures' mean scores, significant difference existed between the young and older students, $F(5,91)=.235$, $p<.01$. A significant difference was found between the younger and older students on the SPAS test, $F(1,95)=4.8$, $p< .05$. The separate multivariate analysis of variance, Table 4, including all of the existing cases on the SPAS pre-test subscales indicated a significant difference between younger and older students, $F(6,111)=.230$, $p<.001$. This finding indicated that there was a significant difference between younger and older students on the SPAS, likely on at least one of the subscales. Univariate analysis on the SPAS subscales showed significance on three of the

seven subscales; Confidence, $F(1,116)=17.5$, $p<.001$; School Satisifaction, $F(1,116)=7.52$, $p<.01$; and Penmanship/Neatness, $F(1,116)=3.75$, $p<.05$. On all three of these subscales, younger students scored significantly higher than older students. No difference between younger and older students was found on the other four subscales.

Discussion

The results showed that LD students' attitudes toward regular class students, as expressed on the Student Attitudes Questionnaire, were not significantly different from their attitudes toward LD students in their own class. Likewise, regular class students' attitudes toward LD students were not significantly different from their attitudes toward other regular class students. However, results of the Who's On Your Team test indicated that LD students chose regular class students approximately one-third as often as they chose LD students from their own class to be on their team. Regular class students, on the other hand, chose LD students slightly less than one-third as often as they chose other regular class students.

This finding is important because it demonstrates that the measurement of attitudes will yield different results, possibly conflicting, depending on the type of instrument being used. Previous research pointed to a critical question: should the focus of assessing social acceptance of handicapped people be on a general handicapped population or on specific individuals known to the persons being studied? Causing an attitude to be generalized from a specific individual, or set of individuals, to a larger unfamiliar population is a noble, but difficult endeavor. However, it has been shown that attitudes toward specific populations known to persons being studied are more easily assessed as well as influenced. The important question raised here is, what aspects of social attitude, or social acceptance reflect what Custer and Osguthorpe (1983) referred to as that which is necessary for productive and gratifying living. Is it something which can be assessed by means of passive, self-report measures or is it a function of interpersonal rapport? In this case, the passive, self-report technique as used in the Students' Attitude Questionnaire

showed that both LD students expressed positive attitudes toward other LD students and toward the regular class students. Similarly, regular class students expressed positive attitudes toward other regular class students and toward LD students. However, when they were required to express their attitudes more actively by chosing teammates, differences arose between number of students of their own kind that were chosen and the number of students of the other kind that were chosen. While it may be expected that students from their own class would be chosen more than students from other classes, this finding is important because it illuminates an interesting issue when studying attitudes and the manifestations of attitudes with special education students who are in self-contained classrooms. If positive attitudes between LD and regular class students are defined strictly in terms of the students' ability to passively report positiveness, by means of choosing adjectives, for example, actual social interactivity is not a point of interest. With such a focus, then, one may conclude that LD and regular class students have similiar attitudes toward students of the other kind, in other classes, as they do toward students of their own kind, who are in their own class. However, a deeper or richer understanding of this attitude could be obtained if a positive attitude is defined in terms of attitudinal self-report as well as actual choices about interacting with the other kind of students, which could lead to real social consequences.

From this finding, then, it is concluded that on one level LD and regular class students expressed attitudes toward each other which are not significantly different from their attitudes toward students of their own kind. While LD and regular class students have positive attitudes about each other at a distance, as indicated by the results of the Student Attitudes Questionnaire, this finding also suggests that the students' positive attitudes may not transfer into a positive rapport with each other (as perceived by the students themselves) and that they might not feel comfortable actually interacting.

It has been concluded that both the regular class and LD students expressed attitudes

toward students of their own kind which were similar to their attitudes toward students of the other kind. The next question was, are the LD students' attitudes toward regular class students similar to the regular class students' attitudes toward the LD students? The formerly mentioned findings showed that LD and regular class students' both expressed positive attitudes toward the other and that their attitudes toward the other kind were not significantly different from the attitudes toward their own kind. However, further evidence was found which indicated that LD students chose regular class students to be on their team slightly more than regular class students chose LD students. Interestingly, no significant difference between LD and regular class students was found on the Students' Attitude Questionnaire. This may mean that when LD students anticipate a social interaction, they feel more comfortable with regular class students than the regular class students do with them, even though passive expression of attitudes is similiar between the two kinds.

The team choice finding supports the research of Siperstein et. al. (1978) and Bruininks (1978) that LD students tend to overestimate their social acceptability. When given an opportunity to select a teammate, LD students would choose to be on a team which would include regular class students who likely would not include them. While Siperstein (1978) concluded that LD students' overestimation of their social status may actually enhance their social status, studies by Bruinink's (1978) challenged Siperstein's claim. The imbalance seen in the present study may actually contribute to the LD students' social unacceptability and gives reason for social skills training for LD students' which will not only help them to become more socially acceptable but to develop skills at better understanding their status among their peers. However, the influence of overestimated social status on actual social status is not yet certain.

Another interesting issue which stems from this finding is that LD children are always outnumbered in schools. If they are at all involved in the social climate of the school, they will find themselves desiring to participate in social activities with regular class students who are

likely not to want them involved. Thus, it is inevitable that LD students will be placed in situations where there is potential for social interaction with regular class students. However, if in these situations LD students are not accepted by regular class students, but nevertheless choose to be involved, they may escalate their own social rejection. Consequently, it is important for special educators to be aware of LD students' need to be given opportunities which will lead to increased social acceptance before these occasions for social interaction arise.

One of the important questions which follows is whether or not younger students' attitudes were different from older students' in any way. The first research question was: Prior to treatment is there a difference between the younger students and the older students in social attitudes as measured by the social attitude instruments? Interestingly, younger students expressed significantly more positive attitudes toward the other kind of students than older students on the Student Attitudes Questionnaire. This was the case in both LD and regular class populations. However, the difference in attitudes between the older and younger students was only evident on the Student Attitudes Questionnaire, not on the Who's On Your Team test. This finding may suggest that while the younger students' self-reported attitudes were more positive about the other kind of students, some sort of inhibition was present which prevented them from manifesting this attitudinal difference when making team choices. Perhaps they held a distant liking for the other kind of students, but felt uncomfortable with them.

This finding, however, also indicates that older students experienced attitudes which were more negative than younger students and possibly were also inhibited, for some reason, from manifesting this attitude when making team choices. Perhaps the older students had motivations which somehow went beyond their self-reported attitudes about the other kind of students. Perhaps they felt some sort of moral imperative to choose to be around the other kind of students in spite of their attitudes. It is also likely that the older students were more capable of enjoying being around the other kind of students whose attributes they did not appreciate. This

finding may suggest that attitude and rapport can function separately. However, further research is needed before firm conclusions can be made.

Another possible explanation for the difference due to grade group on the Student Attitude Questionnaire and the lack of difference on the Who's On Your Team test is that both the younger and the older students were manifesting two different kinds of attitudes. The School Attitude Questionaire elicits attitudes about the other kind of students with no mention or relativity to rapport. The Who's On Your Team test, however, addresses nothing about opinions pertaining to attributes of the other students and applies strictly to social distance and rapport. In this case, the two aspects of attitude may have functioned separately. Once again it is apparent that there are two critical aspects to social acceptance; mental attitude and rapport. What is not understood is how these two aspects relate to one another. Is one a function of the other ? Does one precede the other? Can the two constructs operate independently or are they interdependent?

Attitudes about school. The fourth hypothesis that was tested by this study was: Prior to treatment, LD students will demonstrate a less positive attitude toward school and learning than regular class students as measured by school attitude tests. The results of the SPAS test indicated that LD students were significantly more confident, generally, about themselves academically. While research on academic self-esteem, Osguthorpe (1984), has suggested that low academic self-esteem is one of the two primary difficulties faced by LD students, the results of the SPAS test show the contrary. Perhaps this is similiar to other evidence that LD students tend to overestimate their own academic abilities (Siperstein et. al., 1978; Bruininks,1978; Horowitz, 1981). It is also possible that this finding does not reflect an overestimation, but rather a response to the programs given them which are especially aimed at improving academic self-esteem.

Another finding pertaining to attitudes about school addressed the second research

question: Prior to treatment is there a difference between the younger and older students in attitudes about school and learning? The results indicated that the younger students scored significantly higher than older students on three of the SPAS subscales. One possible explanation for this may be that with age, or length of time in school, students' academic self-esteem in the areas of general confidence, school satisfaction and penmanship/neatness decline. However, the results of the Attitudes About School Questionnaire indicated the opposite, that the older students scored significantly higher than the younger students. This instrument reflects the students' insight on learning processes more than on self-esteem, which explains the contradictory results. These findings suggest that with age and length of time in school, students will likely become less confident, but will gain more insight about learning processes.

Conclusions

Several conclusions may be drawn from this study. The findings show that LD and regular class students had positive attitudes about each other at a distance. However, this positive attitude did not transfer into positive rapport with each other, as they did not choose the other kind of students on the team test as much as they chose students of their own kind. This suggests that they did not feel as comfortable actually interacting as they might have. In addition, LD students tended to overestimate their social acceptance, choosing the regular class students to be on their team more than the regular class chose them. Younger students were also more positive toward students of the other kind than were older students on self-report measures. However, because this difference between younger and older students was not manifested on the team choice measure, it was possible that the younger students held a distant liking for the other kind of students, but, nevertheless, felt uncomfortable with them. These findings suggested that mental attitude and social rapport can function separately. A further

conclusion was that LD students were significantly more confident about their general ability than were the regular class students. This finding may be due to overestimation (a tendency found in LD students' self-perceptions) or a response to recent programs aimed at improving LD students' academic self-esteem. A final conclusion was that younger students were generally more confident, satisfied with school, and perceived themselves as neater than older students. This suggested that with age or length in time with school, students may become less confident and satisfied in these areas.

Further study of social acceptance between LD and regular class students should be done for the following reasons: 1) to develop more sensitive attitude instruments to be used when assessing social acceptance; 2) to study the difference between attitudes toward hypothetical groups and actual persons known to the respondents; 3) to study the difference between passively reported attitudes and actively expressed attitudes; and 4) to assess current level of social acceptance of LD students as various improvement efforts are made in this area.

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Table 1
Summary of Empirical Studies Examining the Social Acceptance of LD Students

Citation	Sample	Measurement Instrument(s)	Result
Bruininks (1978)	LD children		LD children are less accurate than their regular class peers in assessing their own social status.
Bryan (1974)	62 third, fourth and fifth-grade LD & regular class students	1. Friend List 2. Attribute List Both measures elicited attitudes about a specific population known to the respondents.	LD children were not accepted and were rejected by regular class peers. Regular class students LD students as scared, unhappy, and, generally undesirable to have as playmates.
Bryan, Wheeler, Felcan & Henek (1976)	Third- to Fifth-graders	Observational study on the quality of interpersonal communications	LD children emited significantly more competitive statements than non-LD children. Non-LD children were the recipients of significantly more statements showing consideration
Garrett & Crump (1980)	100 fourth, fifth-, and sixth-grade regular class and LD	1. Friend List Elicits attitudes about a specific population known to the respondents.	LD students were preferred less frequently and, thus, were found to have significantlly lower social status than regular class students.
Garrett & Crump (1980)		Social Acceptance Scale	No difference between LD and regular class students. LD students tended to over-estimate their social status while regular class students did the converse.
Horowitz (1981)		Attitudes about a specific population known to the respondents.	LD children were less popular than their regular class peers, but were no less insightful abuot how others regarded them.
Levy & Gottlieb (1984)	34 LD & regular class students	Friend list and observation Attitudes about a specific population known to the respondents.	LD children were of lower social status than non-LD peers. Regular class students actually play with approx. one-half of the LD children the express a liking toward.

Miller (1984)	332 second-, to sixth-grade students	1. Scale of Children's Attitudes Toward Exceptionalities (SCATE) Elicits attitudes about a general population.	LD students were less socially accepted than regular class students. However, attitudes toward LD students were more positive than toward children with other handicaps.
Prillaman (1981)	362 second- to sixth-graders of whom 28 were LD	Friend list. Attitudes about a specific population known to the respondents.	LD children were not rated lower than regular class peers in popularity. LD children were accepted just as regular class students. LD students were significantly overrepresented in the isolation group
Sainato (1983)	regular and LD students elementary age	Attitudes about a specific population known to the respondents.	No significant difference between social acceptance of LD and regular class students.
Siperstein, Bopp & Bak (1978)	177 fifth- & sixth-graders 22 of whom were LD	1. List students opinions of best athlete, smartest and the best looking student. Elicited attitudes about a specific population known to the respondents.	LD students were signficantly less popular than regular class students.LD students were never among the most popular, yet not overrepresented in the social isolates group.

Table 2

Multivariate Analysis of Variance of the LD and Regular Class Students' Performance on the SPAS Subtests

Multivariate Analysis of Variance

Type of Test	Value	Hypoth. df	Error df	Sig. of F
Hotelling's T^2	.148	6	110	.017
Wilk's Lambda	.871	6	110	.017

Variable	Kind	M	SD	F
Gen. Ability	LD	1.57	.238	
	Regular	1.56	.276	.07
Read./Spell	LD	1.64	.280	
	Regular	1.65	.243	.002
Confidence	LD	1.49	.242	
	Regular	1.41	.172	4.73*
School	LD	1.64	.258	
Satisfaction	Regular	1.70	.233	2.47
Pen./Neatness	LD	1.66	.277	
	Regular	1.70	.221	1.025
Arithmetic	LD	1.66	.261	
	Regular	1.68	.207	.2818

LD Group n= 45 Regular Group n=73 *p<.05

Table 3

Analysis of Variance on the Attitudes About School Pretest

Pretest, Adjusted Mean Scores and Univariate F-tests of Significance

Grade Group	Kind	M	SD	F
younger	LD	2.58	.519	
	Regular	2.91	.552	
younger grouped		2.8	.559	
older	LD	3.1	.610	
	Regular	3.0	.442	
older grouped		3.04	.543	
Grade Group				8.85*
Kind x Grade Group				4.50**

younger n= 50 LD n= 45 *p<.01

older n= 69 Regular n= 73 **p<.05

Table 4

Multivariate Analysis of Variance on the SPAS Subtests

Hotelling's T2	.23042	6	111	.001
Wilk's Lambda	.81273	6	111	.001

Pretest Means, Standard Deviations and Univariate F-tests of Significance

Variable	Grades	M	SD	F
Gen. Ability	younger	1.57	.264	
	older	1.56	.260	.061
Read./Spell	younger	1.69	.202	
	older	1.62	.284	2.139
Confidence	younger	1.53	.191	
	older	1.38	.193	17.51*
School	younger	1.75	.188	
Satisfaction	older	1.63	.250	7.519**
Pen./Neatness	younger	1.74	.188	
	older	1.65	.270	3.745***
Arithmetic	younger	1.67	.168	
	older	1.67	.262	.0427

younger	n= 48	*p<.001
older	n= 70	**p<.01
		***p<.05

The Effects of Reverse-role Sign Language Tutoring on Communication Skills of Retarded Students

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Running head: SIGN LANGUAGE

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Abstract

Sign language instruction has become an increasingly popular treatment for normal-hearing mentally retarded persons with communication deficits, though research findings concerning the benefits of such instruction are inconclusive. One successful method of sign language training has been reverse-role tutoring, in which retarded students teach sign language to regular class peers. In this study, 17 moderately and severely retarded students tutored 68 regular class elementary students in sign language. A pretest-posttest control group design was used to measure the effects of the sign language instruction combined with reverse-role tutoring on the speech and language skills of the retarded students. Results showed that the handicapped students in the experimental group (those who learned and tutored sign language) performed similarly to the handicapped students in the control group (those who did not learn sign language) on five instruments designed to measure receptive and expressive communication skills.

The Effects of Reverse-role Sign Language Tutoring on Communication Skills of Retarded Students

Communication is a priority in the development of meaningful interactions, yet the majority of moderately and severely mentally retarded individuals have impaired communication skills. According to federal reports (Grossman, 1983), speech or language disability combined with mental retardation is the most common of all dual disabilities. The President's Commission on Mental Retardation (1975) reported that an estimated 55% of all mentally retarded persons manifested some form of speech handicap, and additional studies (Garcia & DeHaven, 1974; Reich, 1978) estimated that 75% to 80% of people with IQ's below 50 have severe speech problems.

Instruction in manual communication has become an increasingly popular treatment for normal-hearing mentally retarded persons with communication deficits. A 1977 survey by Goodman, Wilson, and Bornstein (1978) revealed 4,000 persons in special education programs in 28 states were receiving some type of sign language instruction. At that time the authors of the survey speculated that well over 10,000 clients in the United States were involved in sign programs and that the number would be increasing. Of the 129 survey respondents, 72% indicated they were using sign with moderately retarded persons, 79% were using sign with severely retarded persons, and 53% were using sign with profoundly retarded persons. A similar survey in England, Wales, and Scotland (Kiernan, Reid, & Jones, 1979) showed that in 1978, 46% of the schools for severely and profoundly mentally retarded children were using signs as a form of communication. Based on descriptions of adaptive behavior of retarded persons published by the American Association on Mental Deficiency (Grossman, 1983), one would assume that the majority of the

moderately and severely retarded persons receiving sign training already had some degree of expressive verbal communication and that attempts were being made to improve those speaking abilities.

Research, however, is inconclusive regarding the benefits of sign language instruction for retarded students. While most retarded students in research studies learned at least a few signs, their ability to functionally use and generalize the signs to new situations varied (Lombardino & Kaswinkel, 1983; Duker & Michielsen, 1983; Duker & Morsink, 1984; Kohl, Wilcox & Karlan, 1978; Williams, 1978). Similarly, sign language instruction benefited communication skills of some retarded students (Kotkin, 1979; Kotkin, Simpson, & Desanto, 1978; Penner & Williams, 1982; Sisson & Barrett, 1984) but was no more effective than speech-alone training in facilitating speech and language skills of other retarded students (e.g. Kahn, 1981; Moody, 1980; Romski & Ruder, 1984).

One innovative and successful approach to teaching sign language to handicapped students has been reverse-role tutoring (Custer & Osguthorpe, 1983; Osguthorpe, 1985; Osguthorpe, Eiserman, & Shisler, 1985). These programs have employed intellectually handicapped students in self-contained elementary school classrooms as the tutors with regular class students in the same schools as the tutees. The content of the tutoring has been sign language. In these studies retarded children who taught sign language to regular class students were reported by their parents to have increased and improved sentence length, sentence structure, speech clarity, and general conversational abilities as a result of participation in the sign tutoring program.

The purpose of this study was to systematically examine the effects of serving as reverse-role sign language tutors on the communication skills of moderately and severely mentally handicapped students. The hypothesis was: Through their participation in the reverse-role tutoring study mentally retarded tutors will demonstrate a significant increase in verbal communication skills, as

measured by standardized language tests, when compared to a comparable group of retarded students who do not participate as tutors.

Method

Subjects

Handicapped subjects were 33 mentally retarded students (11 girls and 22 boys), ranging in chronological age from 7.1 years to 18.4 years, in mental age from 2.9 years to 7.4 years, and with IQ scores from 35 to 73. Four students were mildly retarded, 20 were moderately retarded, and 9 were severely retarded. Four of the handicapped students had mild hearing losses but only two wore hearing aids. One student had cerebral palsy, and 13 students had Down Syndrome. The speech of the mentally handicapped students varied from normal to unintelligible. As measured by the Arizona Articulation Proficiency Scale: Revised, 8 students had normal or near normal speech, 11 had intelligible speech with noticeable errors, 10 had intelligible speech with careful listening, and 4 had speech that was usually or always unintelligible. Mean length of utterance at the beginning of the study varied from 1.2 to 5.7 morphemes.

A total of 68 regular class first through sixth grade students, 36 from school one and 32 from school two, with no prior knowledge of sign language, were selected by their classroom teachers and randomly assigned to the treatment or control group. Each special education school had two treatment groups, one composed primarily of younger students and one composed of older students. In order to approximate peer age tutoring, regular class students were assigned to tutoring groups according to age. Within each tutoring group, regular class tutees were randomly assigned to handicapped tutors.

Instruments

Five communication instruments were administered to all of the mentally handicapped students as pretests and posttests: The Arizona Articulation Proficiency Scale: Revised (Fudala, 1963), the Expressive One-Word Picture Vocabulary Test (Gardner, 1981), the Receptive One-Word Picture Vocabulary Test (Gardner, 1985), the Miller-Yoder Language Vocabulary Test (Miller & Yoder, 1984), and a language sample of 50 spontaneous utterances adapted from Bloom and Lahey (1978). The number of signs known by the treatment group students was also measured before and after the treatment.

Procedure

The majority of the sign language vocabulary used was centered around topics suggested by the special education students' teachers, thus ensuring the greatest opportunity for meaningful learning and providing continuity with concurrent class instruction. Highly iconic manual sign words were preferred over those whose signs bore little resemblance to the action or object being represented (Goossens, 1983; Griffith & Robinson, 1980; Bray & Thrasher, 1982). Because many of the handicapped tutors could not read, word selection was also limited to words which could be easily represented in picture form. American Sign Language with English word order was already being used in varying degrees at both special education schools and was the manual communication system used in the study.

Tutors were provided a printed cue card showing (a) the word or phrase being signed, (b) an iconic picture representation of the word or phrase, and (c) a graphic representation of the sign being performed. To assist regular class tutees whose handicapped tutors had poor speech skills, tutees could see the word in print but could not see the graphic representations of the word.

Initial training for tutors consisted of 15-minute to 20-minute sessions conducted five times weekly for two weeks. Students were taught the signs using pictures and actual objects, with the

printed words being visible but never directly taught. Students were also instructed in how to demonstrate and monitor correct production of the signs and to give positive feedback. A teacher's aide was employed to assist the signing instructor in monitoring progress and providing individualized practice.

The handicapped tutor - regular class tutee tutoring sessions began during the third week of the project and continued for 13 weeks. Tutoring sessions were conducted for 15 minutes three days a week. The first tutoring session lasted four weeks while the three successive sessions lasted three weeks each. The regular class tutee group changed every three weeks in order to provide broader contact for the handicapped students. Tutor training continued for 15 minutes two days a week while the reverse-role tutoring was progressing.

Results

The 17 students in the treatment group learned from 102 to 206 signs with a mean of 162 and a standard deviation of 31. A comparison of these pretest scores with posttest scores showed that students in the treatment group had significantly improved their receptive and expressive sign language skills, $t(16) = 5.04$, $p<.001$.

However, a multivariate analysis of covariance on the scores of the five communication tests, using the pretest scores and IQ as covariates, indicated no significant differences between the treatment and control groups, $F(1, 14) = 1.99$, $p>.10$. Additionally, no significant pretest to posttest score changes occurred for either of the groups on the five communication skills tests. An analysis of the reliability of the five tests, including the pretest and posttest on each of the five tests, yielded a Cronbach's alpha of .72.

Discussion

The results of this study indicate that moderately and severely mentally retarded school age children were successful in learning sign language and teaching those signs to regular class students at nearby schools. However, the sign instruction and tutoring experience did not significantly affect the handicapped tutors' communication skills, as measured by standardized tests.

The fact that this study showed that sign language did not improve communication skills of students in the treatment group following 15 weeks of sign training is consistent with the findings of Ferguson (1975) and Weller and Mahoney (1983), both of whom used standardized tests to measure language or communication prior to and following instruction in sign language, and both of whom failed to find any changes in communication skills due to the sign training. However, the Ferguson, and Weller and Mahoney studies indicated that subjects made significant gains on the language tests given, while the results of the present study indicated no significant changes from pretest to posttest.

The failure to find that sign language facilitated communication skills in moderately and severely retarded individuals, is significant in light of Goodman, Wilson, and Bornstein's (1978) estimation that well over 10,000 retarded persons in the United States were receiving sign language training in 1978, and that the number would be increasing. Presumably, the intent of much of that instruction was to improve the speaking abilities of the retarded students. This study indicates, however, that the assumption that sign language training improves speech may be erroneous and that teachers should be cautious if electing to present sign language instruction solely for the purpose of facilitating students' verbal communication skills.

No evidence has been presented that sign language instruction inhibits speech acquisition in retarded persons who do not have other handicapping conditions such as autism (Carr, 1979). One

would assume, therefore, that sign language instruction should not be prohibited in the special education classroom, nor should it be restricted only to students who do not have expressive verbal communication.

Teachers and researchers should be encouraged to conduct experiments to determine the effects of sign language instruction on the acquisition of reading and spelling skills, and to utilize sign language to reinforce vocabulary acquisition. Additionally, moderately and severely retarded students who attend school with students who use use sign language as a primary means of communication, should be encouraged to learn signs in order to communicate with their classmates.

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The Effects of Reverse-role Tutoring on the Attitudes of Regular Class Students toward Retarded Students

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Running head: REVERSE-ROLE TUTORING

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Abstract

Mentally retarded students have often been poorly accepted by regular class students. In Study 1, 17 retarded students tutored 51 regular class elementary students in sign language in order to improve the attitudes of the regular class students toward the retarded students. Results indicated (a) no significant pretreatment to posttreatment changes in attitudes of regular class students toward retarded students, and (b) no significant differences between attitudes of students in the treatment and control groups. Study 2 measured the attitudes of 115 regular class elementary and junior high students toward retarded and regular class peers. Attitudes toward regular class peers were significantly more positive than attitudes toward retarded students, and attitudes toward retarded students attending nearby schools were more positive than attitudes toward retarded students in self-contained classrooms in the regular school.

The Effects of Reverse-role Tutoring on the Attitudes of Regular Class Students toward Retarded Students

Moderately and severely mentally retarded children have frequently been poorly accepted by regular class students (Gresham, 1982). The negative attitudes of regular class students toward handicapped students have been caused primarily by misbehaviors of the handicapped students while positive attitudes have been generated largely by demonstrations of academic competence by the handicapped students (Gottlieb, Semmel, & Veldman, 1978). One successful approach developed to create positive interactions between mentally retarded and regular class students has been reverse-role tutoring (Custer & Osguthorpe, 1983; Osguthorpe, 1985; Osguthorpe, Eiserman, & Shisler, 1985). These programs have employed intellectually handicapped students in self-contained elementary school classrooms as the tutors with regular class students in the same schools as the tutees. The content of the tutoring has been sign language. These studies indicated that reverse-role tutoring resulted in increased contact between retarded and regular class students during free-play times on the playground.

The reverse-role tutoring studies also indicated that greater gains in free-play time with regular class students occurred for the less handicapped students than for their more severely handicapped peers. This finding was consistent with Burton and Hirshoren's (1979) suggestion that the more severe the handicapping condition, the greater would be the rejection by regular class peers. However, handicapped students labeled as retarded have sometimes been more acceptable to regular class children than handicapped peers whose retardation was less apparent (Budoff & Siperstein, 1978). While the students in the previous studies were classified as educable mentally retarded and attended the same school as the regular class students, moderately and severely mentally retarded students enrolled in self-contained schools might also benefit and succeed

academically and socially in the role of tutors for regular class students.

Study 1

The purpose of Study 1 was to examine the effects of serving as reverse-role tutees on the attitudes of regular class students toward retarded students attending nearby schools. The hypothesis was: through their participation in the reverse-role tutoring study, regular class tutees will demonstrate more positive attitudes toward mentally retarded students at adjacent schools than regular class students who do not participate as tutees.

Subjects

Handicapped subjects were 33 mentally retarded students (11 girls and 22 boys), ranging in chronological age from 7.1 years to 18.4 years, in mental age from 2.9 years to 7.4 years, and with IQ scores from 35 to 73. Four students were mildly retarded, 20 were moderately retarded, and 9 were severely retarded. One student had cerebral palsy, and 13 students had Downs Syndrome. The speech of the retarded students varied from normal to unintelligible. The retarded students, attending two self-contained special education schools, were randomly assigned to treatment and control groups. Students in treatment groups were then separated according to age, forming younger and older treatment groups at each school.

A total of 102 regular class first through sixth graders, 54 from school one and 48 from school two, with no prior knowledge of sign language were selected by their classroom teachers and randomly assigned to the treatment or control group. The students attended elementary schools adjacent to the special education schools. Each special education school had two treatment groups, one composed primarily of younger students and one composed of older students. In order to approximate peer age tutoring, regular class students were assigned to tutoring groups according to

age. Within each tutoring group, regular class tutees were randomly assigned to retarded tutors. Although 102 regular class students participated,only 93 students completed both the pretest and the posttest.

Three tutoring sessions of three weeks each were conducted, allowing the largest possible number of regular class students to participate in the signing program. The three tutoring sessions provided retarded tutors the opportunity of tutoring three different regular class tutees in a one-on-one situation, and provided encounter situations which could be compared.

Instrument

An attitude questionnaire designed specifically for the study was administered as a pretest to each student in the regular class treatment groups immediately before each group began receiving sign language instruction. Simultaneously, the scale was administered to the regular class control groups. At the conclusion of the nine-week study, the attitude questionnaire was again administered to the entire group of regular class students as a posttest. Ninety-three students completed both the pretest and the posttest. The attitude questionnaire, based on a similar questionnaire used in previous reverse-role tutoring studies (Shisler, 1986), was a Leikert-type rating scale including 19 positive and 13 negative adjectives, statements or questions such as "happy," "sloppy," and "If you had a retarded brother or sister, would you tell your friends?" The five-point quantitative scale asked students to mark whether each item described the retarded students at the adjacent schools always, most of the time, sometimes, once in a while, or never.

Procedure

preceded by two weeks of initial instruction for the retarded tutors and a four week pilot study, the handicapped tutor - regular class tutee tutoring sessions began during the seventh week of the project and continued for nine weeks. Tutoring sessions were conducted for 15 minutes three days a week. The regular class tutee group changed every three weeks in order to provide broader contact for the handicapped students. Tutor training continued for 15 minutes two days a week while the reverse-role tutoring was progressing.

Results

An analysis of variance indicated that regular-class students showed no significant changes in attitude as measured by the questionnaire developed for this study, $F(1, 68) = 1.98$, $p>.10$. Scores varied from 68 to 157 with changes of from -44 to +28. A reliability analysis produced a Cronbach's alpha of .96. While attitudes of the treatment group did not significantly increase over attitudes of the control group, neither did they significantly decrease.

When compared to attitude scores of regular class students in a similar study (Shisler, 1986), the attitude scores of regular class students in this study were unexpectedly high.

Study 2

Because regular class students in Study 1 demonstrated unexpectedly positive scores when describing their attitudes toward mentally retarded students at adjacent schools, a second study was conducted to determine whether regular class students in other schools would attain equally high scores when rating retarded students in self-contained classrooms in their own schools. It was assumed that the regular class students in the second study might have had more contact with retarded students at their own schools than regular class students in Study 1 had with retarded

students in nearby schools. The purposes of Study 2 were (a) to examine the differences between attitudes of regular class students toward regular class peers and toward retarded peers in self-contained classrooms in their own schools, and (b) to examine the differences between regular class students' attitudes toward retarded peers in self-contained classrooms in their own schools, and toward retarded students in nearby self-contained schools.

The hypotheses for Study 2 were based on studies indicating that the attitudes of regular class students toward retarded students tend to become increasingly more negative as the contact between the two groups increases (Goodman, Gottlieb, & Harrison, 1972; Gottlieb & Budoff, 1973; Gottlieb, Cohen, & Goldstein, 1974). The hypotheses were: As measured by an attitude questionnaire: (a) regular class fourth and seventh grade students will demonstrate significantly more positive attitudes toward regular class peers than toward retarded peers in self-contained classrooms in their schools, and (b) regular class students in Study 2 will demonstrate significantly more positive attitudes toward mentally retarded students in self-contained classrooms in their own schools than did the regular class students in Study 1 toward the retarded students enrolled at nearby schools.

Subjects

Subjects in Study 2 were 115 fourth and seventh grade students residing in the same school districts as the students in Study 1. In each district, the elementary and junior high schools containing the largest number of self-contained classrooms for intellectually handicapped students were selected. One fourth grade classroom or one seventh grade classroom was selected by the principal at each school based on teachers' schedules and willingness to participate. A total of 115 regular class students participated in Study 2 including 48 fourth grade students, and 67 seventh grade students.

Instrument

The instrument used in Study 2 was very similar to the attitude questionnaire given in Study 1. Based on correlation analyses of the instrument used in Study 1 and a similar instrument used by Shisler (1986), eight items on the attitude questionnaire were changed in order to obtain a more uniform correlation of items.

Procedures

Each of the regular class students completed the study two times, first when instructed to think about a classroom of peer-aged retarded students in their own school, and secondly when told to think about another specified classroom of fourth or seventh grade regular class students.

Research Design and Data Analysis

Attitudes toward retarded and regular class students were compared using a paired t-test. The effects of grade, school, class, and sex were determined using an analysis of variance procedure. The total mean score for attitudes toward retarded students was also compared to total mean scores in Study 1, but was not statistically compared because the instruments were not equivalent. However, mean subtotals were determined for the 24 items which were identical on the questionnaires given in Study 1 and Study 2, and these mean subtotals were compared using a t-test.

Results

A reliability analysis of the attitude questionnaire used in Study 2, using Cronbach's alpha, indicated an alpha coefficient of .95. A paired t-test indicated that the mean attitude score when rating regular class peers (M=103) was significantly higher, $t(114) = 3.15$, $p<.005$, than the mean

attitude score when rating retarded peers (M=112). After finding significance between the two groups, an analysis of variance was performed to determine the significance of main effects. The results of the analysis of variance indicated (a) significance of school, $F(3, 105) = 3.51$, $p<.05$, with one elementary and one junior high having greater differences in attitudes than the other elementary and junior high, and (b) significance of sex of the raters, $F(1, 105) = 9.04$, $p<.005$, with boys having greater differences in attitudes between retarded and regular class peers than girls.

Means were also compared to regular class attitude means from Study 1 with the hypothesis that attitudes toward retarded students in Study 2 would be more negative than attitudes toward retarded students in Study 1. The major difference between the first study and the second study involved amount of contact with retarded students. Regular class students in Study 1 attended schools without classrooms for retarded students, but with self-contained special education schools nearby, while students in Study 2 attended schools which did have self-contained classrooms for intellectually handicapped students. The hypothesis was confirmed when regular class students who attended school with retarded students rated the retarded students approximately one standard deviation below the ratings given by regular class students in Study 1. The mean score for the Study 1 subtotal, in which regular class students were asked to rate retarded students at neighboring special education schools, was 93.1. And the mean score for the subtotal on the questionnaire in Study 2, when regular class students were asked to think about retarded students in their own schools, was 79.3. A t-test comparing the two means indicated a significant difference, $t(205) = 6.06$, $p<.001$.

Discussion

The results of this study indicate that: (a) Mildly, moderately, and severely mentally retarded school age children were successful in learning sign language and teaching those signs to regular class students at nearby schools. However, (b) the contact with retarded students at nearby schools did not significantly change the attitudes of the regular class students toward the retarded students as measured by an attitude questionnaire designed for this study. (c) Regular class students had more positive attitudes toward regular class peers than toward retarded peers in self-contained classrooms. And (d) attitudes of regular class students toward retarded students in self-contained schools were more positive than attitudes toward retarded students in self-contained classrooms in the regular school.

It should be noted that although attitude scores in Study 1 did not show significant pretreatment to posttreatment gains, they did not show significant decreases. Previous studies of attitudes toward mainstreamed students suggested that the more contact regular class students had with handicapped students, the more negative the attitudes of the regular class students became (e.g. Goodman, et al., 1972; Gottlieb and Budoff, 1973). The results of Study 1 do not support those findings, as attitude scores did not become more negative, but stayed the same. Rather, results tend to support the findings of Strichart and Gottlieb (1975) who demonstrated that regular class students tended to improve their attitudes toward retarded peers when the retarded students displayed competent skills. The maintenance of scores when they might have been expected to become more negative, could indicate that attitudes became more positive as regular class students saw the retarded students responding competently as tutors, indicating the success of the reverse-role tutoring treatment in affecting positive attitude changes in regular class students. Additional studies of the effects of reverse-role tutoring are warranted.

Study 2 confirmed the conclusion of Gottlieb and Davis (1973) and others that regular class

students were significantly more positive toward regular class peers than toward handicapped peers. The results of Study 2 also indicated that regular class students rated retarded peers in self contained classrooms in their own schools approximately one standard deviation lower than the regular class students in Study 1 rated retarded students at adjacent schools, even after the regular class students in Study 1 had been tutored by the retarded students. This finding supports the supposition presented earlier that the attitudes of regular class students toward retarded students tend to become increasingly more negative as the contact between the two groups increases, unless the regular class students see the handicapped students in a competent role.

The suspected reason the attitude scores of the regular class students in Study 1 were more positive than anticipated, was due to the lack of familiarity between the retarded and regular class students. This suggests that regular class students having only minimal contact with retarded students have unrealistic perceptions of the abilities and disabilities of those retarded students, and that contact between the two groups needs to be regular, frequent, and personal in order to precipitate real relationships and realistic expectations between the two groups.

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TUTORING INTERVENTIONS WITHIN SPECIAL EDUCATION SETTINGS: A COMPARISON OF CROSS-AGE AND PEER TUTORING[1,2]

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In two experiments, cross-age and peer tutoring interventions conducted within special education settings were compared. In Experiment 1, learning disabled (LD) and behaviorally disordered (BD) students acted as tutors of younger LD and BD students. In Experiment 2, same-age LD and BD students alternated tutor and tutee roles. In both experiments, tutors and tutees exhibited academic gains. Only in Experiment 1, however, were attitudinal gains observed. Implications for future research and practice are given.

Within the last decade, the use of tutoring programs involving special education students has been investigated (see Scruggs, Mastropieri, & Richter, 1985; and Scruggs & Richter, in press, for reviews). Frequently, special education students have been used as tutees in such interventions (e.g., Haisley, Tell, & Andrews, 1981; Jenkins, Mayhall, Peschka, & Jenkins, 1974; McCracken, 1979; Sindelar, 1982). In some investigations, however, special education students have been used as the *tutors* of other special or remedial students (e.g., Dequin & Smith, 1980; Epstein, 1975; Higgins, 1982; Maher, 1982, 1984).

Tutoring interventions in special educational settings can take one of two basic configurations: cross-age tutoring or peer tutoring. Peer tutoring involves pairs of students of similar ability working on content appropriate to the skills of each, while cross-age tutoring involves use of one student as "expert" of the content area and provides a focus of control in the tutoring dyad. Cross-age and peer tutoring are basically similar configurations; however, specific strengths and weaknesses can be associated with each. Although older, higher-functioning students may perform effectively as tutors of younger students, it may be more difficult to justify use of their time (Gerber & Kauffman, 1981). And, while peer tutoring can assure that both students are learning skill-appropriate content, the potential quality of such instruction could be questioned.

Recent reviews of tutoring programs in special education settings have concluded that both cross-age and peer tutoring configurations appear to be promising types of interventions (Scruggs, Mastropieri, & Richter, 1985; Scruggs & Richter, 1985). The relative benefits of these two tutoring configurations, however, have not yet been assessed within one larger investigation, using the same dependent measures. That was the purpose of the present investigation, which, in two experiments, evaluated the effects of cross-age (Experiment 1), and peer (Experiment 2) tutoring, using identical materials, procedures, and dependent measures. The study was conducted in two school districts in the same geographic area.

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Choice of dependent measures and tutoring materials was based upon consideration of previous research findings (Scruggs, Mastropieri, & Richter, 1985; Scruggs & Richter, 1985). Reading was chosen as a content area because it has been shown that tutors stand to profit from the fluency-building activities that reading instruction provides (Scruggs, Mastropieri, & Richter, 1985). Because structured interventions were more likely to produce gains, Harrison's Structured Tutoring materials (Harrison, 1976) were used . An attitude toward school measure was used as one outcome criterion, since improved attitudes previously have been reported to result from tutoring programs (e.g., Franca, 1983). Moreover, to ensure consistency of intervention across 10 schools in two school districts, all tutoring sessions were directly supervised by project staff.

Experiment 1: Cross-Age Tutoring

Method

Subjects

Subjects were 47 elementary-age learning and/or behaviorally disordered students (30 boys, 17 girls) attending five different elementary schools in a western rural public school system. All students were officially classified by school districts as learning disabled ($N = 35$) or behaviorally disordered ($N = 12$) according to Public Law 94-142 and local school district criteria. The subjects included 9 first-grade students, 9 second-grade students, 5 third-grade students, 8 fourth-grade students, 11 fifth-grade students, and 5 sixth-grade students. Average percentile reading level across all students as assessed by the Woodcock-Johnson Pretest was 23 ($SD = 8.2$).

Participating teachers were asked to identify pairs of students who would be appropriate for cross-age tutoring interventions (i.e., students who would get along well, read at different levels with one student having good mastery of content, and who would not present substantial scheduling difficulties). In this manner, a total of 27 learning disabled and behaviorally disordered children were identified as tutors ($N = 13$) and tutees ($N = 14$) in the experimental group. One student was used as a tutor for two separate tutees. Twenty other children were selected as controls. The latter came from the same resource and regular class settings as those in the experimental condition, the only difference being that scheduling or matching difficulties prevented them from being integrated into the tutoring program. Experimental and control group students did not differ significantly ($p < .05$) with respect to grade level or achievement.

Materials

Four books were compiled that were modified from the tutoring materials developed by Harrison (1982). The first two books presented the content taught in Beginning Reading I, while the third and fourth tutoring books represented the first and second half of Beginning Reading II.

The criterion tests from the Harrison materials were employed as pre- and postmeasures of reading skills. Three reading subtests from the Woodcock-Johnson Psycho-Educational Battery (Woodcock, 1978) were used to assess word attack, sight-word reading, and reading comprehension.

The Attitude Toward School Measure developed by Marascuilo and Levin (1968) was employed as measures of attitude change for the experimental study. This measure contained such items as "I like to use the library," "I like to do homework," and "I get bored in class," in an agree/disagree format, and was previously successful in monitoring tutoring programs with nonhandicapped learners (Marascuilo & Levin, 1968).

Procedure

The total tutoring intervention lasted 10 weeks, preceded by one week of pretesting and followed by one week of posttesting and feedback. All students were first administered all measures. Project staff then met with tutors individually and introduced them to the methods of structured tutoring: (a) sitting next to the tutee, (b) giving positive feedback and avoiding criticism/ridicule, (c) being sure that the tutee has mastered a step before going to the next step, and (d) using immediate correction of errors and asking student to reread as corrected.

Tutors also were told that some students may progress slowly and that they should, therefore, be patient. The importance of the student's role as tutor also was emphasized to the student, and the importance of this role in making important changes in the tutee's academic functioning also was underlined.

Next, the student role-played a tutoring situation in which the investigator was the tutor and the student, the tutee. The roles were then reversed, and the student was asked to be the tutor. By this method, models for prompting, correcting, modeling, and praising student responses were given to the student and s/he immediately was able to practice them. Finally, when the student had exhibited to the satisfaction of the investigator competence as a tutor, s/he was asked to tutor with the tutee who was brought in to be tutored under the observation of the investigator. When it appeared that the tutor exhibited behaviors appropriate to the tutoring situation, the tutoring intervention was implemented.

Although the amount of time spent on tutoring sessions was made similar across the district at 30 minutes per session, the number of sessions per week varied considerably: Six experimental students were involved in tutoring interventions five days a week, two were involved four days a week, and 19 were involved in tutoring two or three days a week. These tutoring sessions occurred during the spring semester of the school year, and each session was directly supervised by project staff who, without actually delivering reading lessons or content, were available for student questions, as well as to deliver corrective feedback on tutoring procedures. At the end of 10 weeks of tutoring sessions, students were given all posttest measures.

Results and Discussion

Academic Measures

Students took one of two criterion tests, depending on whether they were at the Beginning Reading I (grade level K-3) or Beginning Reading II (grade level 4-6) level. On these criterion tests, percentage of words correctly read was computed on pre- and posttest scores. The pretest score was subtracted from the posttest score to evalute gain score on the diagnostic measure. On this measure, gains of the 14 tutees (21%) were double that of the 20 control students (10%). These differences were statistically significant, $t(33) = 2.46$, $p < .05$. The gain score the 13 tutors made on this diagnostic instrument, however, was only 8%, comparable to that of the control students. In contrast, gain scores on the Woodcock-Johnson subtests were not significantly different for experimental vs. control students. However, the raw gain score exhibited by tutors and tutees on the Woodcock-Johnson word-attack subtest (means of 2.75 vs. 2.83, respectively) was substantially higher than the mean gain of control students (.65). Tutors and tutees both exhibited significant gains on the word-attack subtest, $t(25) = 3.16$, $p < .01$, with tutors independently exhibiting significant gains, $t(11) = 3.11$, $p < .01$. By contrast,

control students did not exhibit significant gains, $t(18) = .78$, $p < .44$. No significant pre-post differences between tutees, tutors, or control students were observed on word reading, reading comprehension, or total reading subscores of the Woodcock-Johnson (all $ts < 1$).

Attitude Measure

On the attitude instrument, tutees gained significantly more than the control group or tutors, with mean pre-post gain scores of 2.69 vs. .00 and −1.29, respectively. And although no significant differences were found using a between-groups analysis of variance, the differential gains seemed to favor tutees. The attitude gain was, in fact, statistically significant, $t(14) = 2.08$, $p < .05$, on the part of the tutees, and nonsignificant on the part of controls and tutors, ($ts < 1$), as evaluated by pair-wise *t*-tests.

In summary, gains on criterion, norm-referenced, and attitude measures suggest that cross-age tutoring is a potentially productive and effective intervention that can be implemented in special education classrooms with relatively little difficulty. It was seen that tutees gained substantially more than tutors on the criterion test, although the tutors did not differ from control students on the same measure. Tutors did exhibit differentially superior performance on the Woodcock-Johnson word-attack subtest, however.

The significant gains in the diagnostic instrument on the part of the tutees indicate that handicapped students can, in fact, be quite potent as tutors of other handicapped students, and that this type of tutoring can provide a useful supplement to special education programming. One interpretive difficulty involved in this experiment was that, in fact, it was project staff and not resource teachers who were actively monitoring the tutoring project. The extent to which teachers themselves could, in fact, monitor these pairs and conduct their own instruction was not determined through the present investigation, although informally teachers expressed no concern that this could be done. In addition, the scheduling difficulties that were foreseen as causing problems with cross-age tutoring were not appreciably realized, and those difficulties that did occur were overcome relatively easily. The results of these findings suggest that resource and self-contained special education teachers would benefit from interventions in which some of their handicapped students served as tutors for students who were reading on a lower grade level. Although the academic benefits to these tutors were less prominent than they were to the tutees, they were nonetheless tangible. It is also possible that students used as tutors in one setting could be themselves tutored by older students in another setting to provide them with additional individualized instruction.

The finding of significant gains in attitudes on the part of tutees, but not tutors, came as somewhat of a surprise to the investigators, particularly in light of the commonly expressed notion (Allen, 1976b) that tutors would be the individuals expected to gain most in affective areas. Strodtbeck, Ronchi, and Hansell (1976), however, provide a rationale for the observed differences in attitudes of the tutees. These authors suggest that students may feel more positively towards themselves because of the positive attention they receive from the older tutor.

The results of Experiment 1 suggest that older special education students functioned effectively as tutors of younger special education students and gained significantly in word-attack skills as a result of the tutoring experience. While tutees demonstrated a significant improvement in attitudes toward school, tutors did not. Experiment 2 was conducted to determine whether similar gains would be observed when students enrolled

in special education classes shared tutoring responsibilities with other students of similar age and ability.

Experiment 2: Peer Tutoring

Method

Subjects and Materials

Subjects for Experiment 2 were 31 elementary-age learning and/or behaviorally disordered students attending 5 different elementary schools in a western rural public school system adjacent to that in Experiment 1. This sample of 31 elementary-age students included 11 second-grade students, 8 third-grade students, 5 fourth-grade students, and 7 fifth-grade students. Average reading percentile assessed by the Woodcock-Johnson pretest was 19 ($SD = 7.6$). In addition, all students had been officially classified by the school district as learning disabled ($N = 24$) and behaviorally disordered ($N = 7$) according to Public Law 94-142 and local school district criteria. Participating teachers were asked to identify pairs of students who would be appropriate for peer tutoring intervention (i.e., for each pair, teachers were asked to select students who would get along well, read at about the same level while being in the same grade level, and pairs of students who would not present substantial scheduling difficulties). In this manner, a total of 16 children (LD, $N = 12$) (BD, $N = 4$) were identified for the combined tutor/tutees role in the experimental group. In addition, 15 children were selected for use as control students. These students were taken from the same settings, same schools, and same teachers as the experimental students, with the only exception being either scheduling or matching difficulties preventing them from easily being integrated into the tutoring program. Materials and dependent measures were the same as those used in Experiment 1.

Procedure

The entire intervention lasted eight weeks, preceded by one week of pretesting and tutoring instructions, and followed by one week of posttesting and feedback. Training and tutoring procedures were the same as those in Experiment 1, with the exception that students were told to alternate tutor and tutee roles once every session.

Although the amount of time spent for most tutoring sessions remained the same across the district at 30 minutes per session, the number of sessions per week varied considerably. Six experimental students were involved in tutoring intervention five days a week, four experimental students were involved in tutoring four days a week, and six experimental students were involved in tutoring two days a week. At the end of the eight weeks of direct tutoring sessions, students were met with individually, given all posttest measures, and given feedback on the tutoring project.

Results and Discussion

Academic Measures

On the criterion test, percentage of words correctly read was computed on pre- and posttest scores. According to this measure, students in the experimental group gained an average of 10% on the diagnostic measure ($SD = .07$), while the control group did not gain (-3%, $SD = .11$). These differences in gain scores were highly significant, $t(28) = 3.96$, $p < .003$. Significant differences were not found between experimental groups on pre-post gain scores on the Woodcock-Johnson reading subtests. However, the experimental group gained 2.1 words on the word-attack subtest of the Woodcock-Johnson

test, while the control group gained a mean of only 1.2 words during the same time period. As in Experiment 1, this within-subject increase was significant for the experimental group, $t(14) = 2.87$, $p < .01$, but only approached significance for the control group, $t(14) = 1.96$, $p > .05$. In contrast, neither group gained significantly on either letter identification or passage comprehension (both within-subject $ts < 1$).

Attitude Measure

Students in experimental and control groups gained only slightly on the attitude measure, with experimental students gaining 1.27 ($SD = 3.53$) points and control students gaining .46 ($SD = 6.28$) points. Although experimental students' gain scores were again higher than those of control students, neither between-group nor within-group pre-post differences were significant, $t < 1$.

Both cross-age and peer tutoring interventions were seen to produce positive results. Students employed as cross-age tutors gained general decoding skills, but did not gain in skills that were a direct component of the tutoring activities, as did their tutees. In contrast, peer tutors and tutees gained in both specific and general reading skills. Of interest is the fact that experimental students in both experiments exhibited gain on decoding skills, but not on comprehension skills as measured by standardized tests. This consistent finding suggests that tutoring interventions in reading may most likely produce gains in word attack skills, and that more direct teacher contact may be necessary to increase comprehension skills.

Attitude gains were observed only in the cross-age configuration, suggesting that cross-age tutoring may hold more potential for social gains. This finding is supported by the work of Maher (1982, 1984), although in those investigations, social benefits were seen to accrue to the tutors, rather than to the tutees of the present investigation.

Additional research is needed to further examine the relative benefits of cross-age vs. peer tutoring; and, in fact, the present authors are currently engaged in such activity (Osguthorpe, Scruggs, & White, 1984). At present, however, it can be stated that both cross-age and peer tutoring represent effective and versatile interventions for special and remedial settings, and certainly appear to be positive alternatives to independent seat work or practice activities. Before initiating such interventions, however, it is important that teachers clearly specify objectives, carefully structure the tutoring sessions, provide regular feedback, and monitor progress toward the completion of objectives. Through these means, teachers can ensure that a tutoring program can be a positive experience for all students involved.

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HANDICAPPED STUDENTS AS TUTORS

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A meta-analysis was conducted on available research documenting effectiveness of handicapped students as tutors of other students. Nineteen articles yielding 74 effect sizes were located. Results indicated that (a) tutoring programs were generally effective; (b) tutees generally gained more than tutors; and (c) tutor and tutee gains on self-concept and sociometric ratings were small, while gains on attitude measures were larger. Implications for instruction and further research are given.

The use of students as instructional agents has been recommended for centuries (see Allen, 1976). Previous reviewers of tutoring literature have concluded that tutoring has many academic and social benefits for both tutor and tutee. In particular, documentation of benefits afforded to tutors seems to be of importance in justifying the use of student tutors in a teaching rather than a learning role.

Much has been written in response to the issue of possible benefits for tutors. It has been mentioned that tutors commonly learn more than tutees (Cloward, 1976; Hassinger & Via, 1969; McWhorter & Levy, 1970). In addition, it has been suggested that acting as tutor can result in a multitude of social benefits, including improved attitudes toward school (Feldman, Devin-Sheehan, & Allen, 1976; Haggerty, 1971), increased responsibility (Allen, 1976; Csapo, 1976), improved social skills (Argyle, 1976; King, 1979), improved self-esteem (Jenkins & Jenkins, 1981; Ross, 1972; Strodtbeck, Ronchi, & Hansell, 1976), heightened level of aspiration (Elder, 1967), and personal confidence (Symula, 1975).

Such gains would indeed be impressive if they could be empirically documented. Unfortunately, several of the above studies suffered from methodologic weaknesses (see Jenkins & Jenkins, 1981, for a discussion), while others report only anecdotal information. Most crucial to the purposes of the present review, few of the above-cited articles refer to special education students.

Tutoring has a potentially important role in special education, for a variety of reasons. First, tutoring may provide a means of delivering the type of cost-effective individualized instruction which provides a necessary basis for special education settings. The quality of this instruction, however, depends to a certain extent on the skills of the tutor. It could be argued that special education students, enrolled on the basis of academic deficiencies, could not function effectively as tutors. Even if it could be argued that these students could be effective tutors, use

of their academic time may be difficult to justify unless it can be demonstrated that tutor social and academic gains can also be expected. Recently, a body of literature has emerged in which special education students have functioned as tutors, and it was the purpose of the present investigation to synthesize the findings of this literature.

Several previous reviews of tutoring literature exist, many of which deliberately or otherwise excluded studies concerned with special education (Allen, 1976; Cohen, Kulik, & Kulik, 1982; Devin-Sheehan, Feldman, & Allen, 1976; Gartner, Kohler, & Riessman, 1971). Other reviews which have addressed special education specifically have cited previous literature selectively (e.g., Gerber & Kauffman, 1981) or have discussed the use of tutors as "behavior change agents," in dispensing tangible reinforcers rather than delivering academic instruction (e.g., Strain, 1981). In addition, books and monographs have been written which have focused primarily on the mechanics of establishing tutoring programs, rather than presenting comprehensive reviews of research (Cooke, Heron & Heward, 1983; Ehly & Larsen, 1980; Jenkins & Jenkins, 1981; Pierce, Stahlbrand, Armstrong, 1984).

Scruggs and Richter (1985) reviewed available tutoring literature in which students classified as learning disabled (LD) were employed as tutors or tutees. They concluded that research design covaried most strongly with study outcomes. That is, studies which had not included a control group were most likely to report positive effects, followed by studies which had employed no-treatment control groups. Most equivocal findings were reported when tutoring was directly compared with alternative instructional intervention, such as teacher-led instruction. Scruggs and Richter concluded, however, that little evidence existed that learning-disabled students could not function effectively as tutors.

Scruggs, Mastropieri, & Richter (1985) employed similar procedures to evaluate tutoring interventions involving students classified as behaviorally disordered (BD). This group of studies focused more on social benefits to tutors than had the research reviewed By Scruggs and Richter (1985). Scruggs, Mastropieri, and Richter (1985) concluded that tutors could be expected to gain with respect to attitudes toward the content tutored and to have positive interactions with the tutee. Generalized social gains, such as self-esteem and sociometric status, were not observed. They also concluded that tutees invariably gained knowledge of the content being tutored, and that tutors gained academically if the tutoring material provided for needed fluency-building activities for the tutor.

The reviews by Scruggs and Richter (1985) and Scruggs, Mastropieri, and Richter (1985) provided important summary information regarding tutoring interventions involving LD and BD students. Those two reviews, however, differ from the present investigation in the following ways: (a) the Scruggs, Mastropieri, and Richter (1985) and Scruggs and Richter (1985) reviews did not focus exclusively on special education students employed as tutors; (b) studies involving intellectually handicapped (IH) students as tutors were not included; and (c) independent variables were not evaluated with respect to a standardized outcome metric, leaving unanswered the issue of the magnitude of tutoring effects beyond the reporting of statistical significance. The purpose of the present investigation, then, was to synthesize findings from all available research in which learning-dis-

abled, intellectually handicapped, and behaviorally disordered students functioned as tutors. Utilizing synthesis procedures, a quantitative evaluation of the social and academic benefits to tutors and tutees was completed.

METHOD

Studies were included in this analysis if the authors of the study identified the tutors as either learning disabled (LD), behaviorally disordered (BD), or intellectually handicapped (IH). In some cases, the author did not label, but described, the handicap of the subjects. In these cases, and also to determine whether reported labels were justified, the definitions provided in PL 94-142 were used as guidelines. Also, only studies in which an academic subject such as reading, mathematics, or language arts was tutored were selected.

Computer data bases of *Psychological Abstracts, Dissertation Abstracts,* and *Education Resource Information Center* (ERIC), were searched for relevant articles. From the computer search and a hand search of the references of relevant articles, 90 articles were located for this analysis. Of these articles, 19 provided enough descriptive information about the subjects' handicaps to allow them to be coded and enough statistical information to calculate standardized mean effect sizes. Investigators who had relied solely on single-subject methodology (e.g., Stowitscheck, Hecimovic, Stowitscheck, & Shores, 1982) were excluded from this analysis. A number of the 19 articles reported the results of several outcome measures. A tabulation of these independent outcome measures resulted in a total of 54 cases of comparisons of tutoring interventions. These 54 cases provided a data set of 74 effect sizes (49 for tutors and 25 for tutees).

From the analysis of previous reviews of handicapped tutoring, variables which the reviewers concluded were associated with tutoring effectiveness were also identified. Conventions for the coding of these variables were constructed. For each article included, the outcome of the dependent variables was coded as an Effect Size (ES). The ES was defined as the difference between the means of the treatment and control groups on a given dependent variable divided by the standard deviation of the control group on that variable ($\bar{X}_e - \bar{X}_c \div SD_c$). The ES is essentially a standard score; it tells what portion of one standard deviation one group mean differs from another group mean. An ES of 1 indicates "a person at the mean of the control group would be expected to rise to the 84th percentile of the control group after treatment" (Smith & Glass, 1977). In those cases in which the means and standard deviations were not reported, other procedures were used to give an estimate of the ES (see McGaw & White, 1981).

In addition to the ES, the characteristics for each study were coded in order to obtain a description of the study. This included a validity estimate for each study in which each of Campbell and Stanley's (1966) threats to internal validity were evaluated. Two articles were randomly selected and given to an independent observer as a coding reliability check. Using interrater percent agreement across all variables, a reliability of .87 was achieved. The two coders then discussed the articles, and the conventions and codes were clarified. At this point, coding reliability was assessed at .95. In addition, all coding was reviewed and checked by three coders.

Since the articles selected for this analysis were thought to comprise virtually the total population of studies, it was not considered necessary to use inferential statistics in the data analysis. Therefore, only descriptive information was calculated and reported.

RESULTS

This section first reports a statistical description of the subjects, the tutoring procedure, and the handicaps of the subjects. Next, the overall results for all the studies are analyzed and compared with the results from those studies which used good quality methodology. Then, the results of the studies are reported by selected subject, intervention, and dependent measure characteristics. It is important to note that effect sizes could be calculated for a large number of study characteristics. In some cases, this would require calculating mean effect sizes involving a very small number of cases. Several effect sizes calculated from less than five cases are included in this section. They are reported to show comparisons with other effect sizes but should be interpreted with caution.

It may be noted from the descriptive statistics in Table 1 that there is a large amount of variability in the study characteristics. The number of subjects ranged from 3 to 75, while their ages ranged from 8 to 28. The number of hours engaged in tutoring was as small as .8 and as great as 20; the number of sessions was as small as 3 and as great as 56. The number of hours engaged training the tutor ranged from .5 to 23.

A majority of the experimental tutors (56%) were labeled behaviorally disordered. The majority of experimental tutees were distributed among learning disabled (20%), intellectually handicapped (18%), and not reported (22%).

The total mean effect sizes for the tutors and tutees, with all 54 cases considered, are shown in Table 2. The above data indicate that being involved in a tutoring intervention raised the performance level of the handicapped tutor and tutee over one-half of one standard deviation above their respective control groups. These standardized mean effect sizes are similar to those found by Cohen et al. (1982) in a meta-analysis of tutoring literature involving nonhandicapped students.

TABLE 1
MEANS AND STANDARD DEVIATIONS OF SELECTED STUDY CHARACTERISTICS

Characteristic	Mean	*SD*	*n*
No. of tutors	18.30	11.43	54
No. of tutees	20.07	16.07	54
Age of tutors	13.07	3.85	51
Age of tutees	10.33	3.20	33
Hours of tutoring	10.83	4.69	38
Sessions/week	3.33	.98	42
Total no. sessions	28.72	14.14	40
Length of sessions (min.)	23.76	10.36	38
Hours of tutor training	7.28	6.58	18
Sessions of tutor training	18.92	27.21	25

TABLE 2
MEAN TUTOR AND TUTEE EFFECT SIZES FOR ALL STUDIES AND FOR GOOD QUALITY STUDIES

	Tutor			Tutee		
	ES	*SD*	*n*	ES	*SD*	*n*
Total studies	.53	.74	49	.58	.60	25
Good quality studies	.48	.60	25	.48	.49	12

Good quality studies, or cases in which the threats to internal validity were coded either "0" (not a plausible threat) or "1" (potential minor problem), made up 50% of the total cases. Data presented in Table 2 indicates that effects for good quality studies are similar to the overall mean ES.

Thirty-one percent of cases used intervention procedures which were substituted for instruction usually delivered to the students, whereas 17% used tutoring to supplement regular instruction. Whether the tutoring intervention was a substitution for or a supplementation of regularly delivered instruction may not make a significant difference in the performance level of the tutee (Table 3). When tutoring was used as a supplement to regular instruction, the tutors performed almost one standard deviation above the control group. When it was used as a substitution, the gain was just over one-half deviation.

Fifty-two percent of cases used academic measures to assess the outcomes of the intervention. Self-concept measures were used in 11% of the cases, whereas 24% used other measures such as behavioral checklists, questionnaires, or behavior rating scales. The outcome measures and the type of instruments used as dependent measures are shown in Table 4.

The effect sizes of tutors (.59) and tutees (.65) on academic measures are very similar. Mean effect size for measures of attitudes toward school, academic content, and other students were higher for tutees (.86) than for tutors (.25). Changes in self-concept and sociometric measures are negligible for both tutors and tutees. Mean effect size for behavior rating scales suggest that tutors are perceived to change more (.89) than the tutees (.10).

TABLE 3
PERCENTAGE OF CASES AND MEAN TUTOR AND TUTEE EFFECT SIZES, SELECTED FOR ACADEMIC SUBJECTS

		Tutor			Tutee		
Variable	%	ES	*SD*	*n*	ES	*SD*	*n*
Subject							
Reading	31	.30	.47	15	.49	.51	13
Math	13	.67	1.12	8	.85	.94	5
Language	15	.25	.11	6	1.13	1.06	2
Reading/writing/math	33	.82	.80	18	.15	.02	2
Spelling	4	.01	.90	2	.51	.43	2
Implementation							
Substitution	31	.63	.91	13	.66	.73	17
Supplement	17	.96	.87	9	.69	.54	2

TABLE 4
PERCENTAGE OF CASES AND MEAN TUTOR AND TUTEE EFFECT SIZES, MEASURES

		Tutor			Tutee		
Measures	%	ES	*SD*	*n*	ES	*SD*	*n*
Outcome measures							
Academic	52	.59	.77	25	.65	.69	17
Attitude	7	.25	.34	4	.86	.51	3
Self-concept/sociometric	13	−.06	.32	7	.12	—	1
Behavior rating scales & checklists	24	.89	.76	12	.10	.16	3
Instrument							
Objective, standardized	33	.41	.50	16	.45	.44	12
Objective, unstandardized	26	.91	1.13	11	.89	.92	7
Rating, questionnaire	37	.38	.58	20	.47	.54	6
Type of measure							
Criterion referenced	57	1.01	1.21	7	1.00	.94	6
Norm referenced	32	.42	.51	15	.45	.46	11

Objective, unstandardized instruments produced higher effect sizes than standardized instruments or ratings and questionnaires. The finding is corroborated by tutor effect sizes found when the cases were separated according to outcome measure reliability. When the reliability was .60 to .79, the tutor effect size was .66. When reliability was .80 to 1.0, the tutor effect size was .48.

Cohen et al. (1982) concluded that tutoring interventions which last five weeks or less show the largest effect sizes. In the present analysis, however, no clear relation between length of intervention and study outcome could be determined.

The type of instrument used to measure the academic gains of the tutor and tutee affected the size of those gains. From Table 4, it is noted that unstandardized, criterion-referenced instruments produce effect sizes that are double those found with standardized, norm-referenced tests.

Another interesting finding is the magnitude of the effect size standard deviations (Tables 2 through 4). Many of the effect sizes calculated for various study characteristics had standard deviations that equaled or exceeded, sometimes by double, the mean effect size. This indicates that there is a considerable amount of variance within the performance levels. What this variance may be attributed to is more than likely a complex combination of subject and intervention variables. Additional research with explicitly delineated subjects and procedures will help identify those variables.

DISCUSSION

A meta-analysis of studies on tutoring interventions which used handicapped tutors and tutees produced 19 codable articles and 74 effect sizes. It may be concluded that handicapped tutors and tutees achieve gains on academic dependent measures as a result of participation in a tutoring program. Generally, tutees achieved greater gains than tutors. Academic gains for tutors and tutees were greatest on criterion-referenced measures, whereas gains were less on norm-referenced measures. Obtained effect sizes of tutors and tutees for academic mea-

sures were comparable to those obtained for nonhandicapped students in a recent meta-analysis of tutoring programs (Cohen, Kulik, & Kulik, 1982). In all, indications are that handicapped students can function effectively as tutors of other handicapped and nonhandicapped students. Furthermore, there is some evidence that handicapped students can function effectively when tutoring roles are exchanged. Scruggs and Osguthorpe (in press) reported an investigation in which LD and BD children exchanged roles as tutors and tutees of reading. This investigation was not included in the present meta-analysis because effects could not be computed for tutors versus tutees; nevertheless, obtained effect sizes paralleled those of other interventions, in that sizable academic effects were obtained, and effects were more pronounced on a criterion-referenced measure of the reading skills taught.

Analysis of tutors versus tutee gains indicated that tutors and tutees each could be expected to gain from tutoring programs. Scruggs, Mastropieri, and Richter (1985) suggested that tutors may be more likely to gain in areas in which there was need for fluency building, whereas tutees may gain in areas of initial acquisition. Also, whereas the present investigation can shed little light on this issue, one investigation is of interest. In a study by Singh (1982), it was determined that tutees had achieved the greatest effect in the area of computation, whereas tutors had gained most in concepts and applications subtests. These findings are provocative and deserve further exploration.

With respect to social or emotional benefits, the present results are more equivocal. Consistent with the findings of Cohen et al. (1982), no effect of tutoring was realized on self-concept or sociometric ratings. Since "self-esteem" gains have been commonly reported to be benefits of tutoring, more attention must be given to this variable before it can be concluded that such perceptions are accurate. Until any further evidence suggests otherwise, then, it may be wiser to assume that tutoring will have little effect on the self-esteem of the tutor or tutee. On the other hand, reported attitudes toward school or the content area tutored do seem to improve with tutoring, a finding consistent with the suggestion of Scruggs et al. (1985). In addition, a sizable mean effect size greatly in favor of tutors was noted on behavioral checklists and rating scales. And, although such measures could point to improved social functioning on the part of the tutor, caution must be taken in interpreting this finding, in light of the fact that most of these rating scales were completed by classroom teachers who were not "blind" to experimental conditions. An example of such positive "bias" can be provided by a dissertation by Roddy (1981). In that investigation, teachers and students both were asked to fill out a "self-esteem" survey, and the teachers were asked to infer the self-esteem score on the part of the students. Results indicated that although teachers perceived improvement in self-esteem on the part of the tutors, self-esteem surveys completed by the students in fact indicated that no such gain had been made. These discrepancies could reflect either an "expectancy bias" on the part of the teachers or could indicate that teachers were observing some subtle aspect of social functioning for which students themselves were unaware. What is certain is that many commonly reported social benefits of tutoring have yet to be supported empirically.

It can be concluded that tutoring is a viable and potentially powerful instructional intervention for special education, and that learning-disabled, behaviorally disordered, and intellectually handicapped students can function effectively as tutors. In addition, certain social benefits have been realized, though perhaps not to the extent reported anecdotally. Future research efforts would do well to investigate specific components of tutoring, and the relation between tutor gain and type of content tutored, and to provide future data on potential social and emotional benefits of tutoring.

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